TRANSACTIONS

OF THE

Bengal Social Science Association.

EDITED BY

THE GENERAL SECRETARIES.

VOL. V.

1871.

CALCUTTA:
PRINTED BY THACKER, SPINK AND CO.
1871.

RINTED BY THACKER, SPINK AND CO.

BENGAL SOCIAL SCIENCE ASSOCIATION.

Patrons:

HIS EXCELLENCY THE VICEROY AND GOVERNOR-GENERAL OF INDIA.
HIS HONOR THE LIEUTENANT-GOVERNOR OF BENGAL.
THE RIGHT REVEREND THE LORD BISHOP OF CALCUTTA.
THE MAHARAJA MAHTAP CHAND BAHADOOR OF BURDWAN.

President:

DR. JOSEPH EWART.

Vice-Presidents:

DR. NORMAN CHEVERS.
H. BEVERLEY, ESQUIRE, C.S.

Council:

THE HON'BLE J. B. PHEAR.
MOULVI ABDOOL LUTIFF KHAN BAHADOOR.
REV. K. M. BANERJEA.
COWAR HARENDRA KRISHNA BAHADOOR.
REV. JAMES LONG.
W. M. SOUTTAR, ESQ., C.S.
R. H. WILSON, ESQ., C.S.
DR. S. G. CHUCKERBUTTY.
J. REMFREY, ESQ.
BABU KESHUB CHUNDER SEN.
" KOONJO LAL BANERJEA.
" PEARY MOHAN MOOKERJEA.
" JUGGODANUND MOOKERJEA.
" RAMANATH LAW.
MANOCKJEE RUSTOMJEE, ESQ.

[illegible]

Honorary Secretaries:

BABU PEARY CHAND MITTRA.
T. J. CHICHELE-PLOWDEN, ESQ., C.S.

List of Sectional Committees for the year 1871.

I.—JURISPRUDENCE AND LAW.

The Hon'ble Mr. Justice Phear, *Chairman.*

Members.
The Hon'ble Dwarka Nath Mitter,
Moulvi Abdool Lutiff Khan Bahadoor,
W. M. Souttar, Esq., c.s.,
Babu Juggodanund Mookerjea,
Babu Koonjo Lal Banerjea,
Babu Mahendra Lal Shome,
Babu Chundernath Bose,

Secs.
Babu Shama Churn Sircar,
Babu Romanath Law,

II.—EDUCATION.

Babu Keshub Chunder Sen, *Chairman.*

Members.
Rev. J. Long,
H. Woodrow, Esq.,
Rev. K. M. Banerjea,
J. Remfrey, Esq.,
R. H. Wilson, Esq., c.s.,
Moulvi Abdool Lutiff Khan Bahadoor,
Cowar Harendra Krishna Bahadoor,
[illegible]chmann, Esq.,
[illegible]u Jodoonath Ghose,

Secs.
Babu Chundernath Bose,
Babu Pertab Chunder Mojoomdar,

III.—HEALTH.

J. Fayrer, m.d., c.s.i., *Chairman.*

Members.
Norman Chevers, m.d.,
J. Fawcus, m.d.,
S. G. Chuckerbutty, m.d.,
Mahendra Lal Sircar, m.d.,
Babu Gunga Persad Mookerjee,
Babu Annoda Charan Kastogiri,

Babu Kanye Lal Dey, *Secretary.*

IV.—ECONOMY AND TRADE.

J. Remfrey, Esq., *Chairman.*

Members.
H. Beverley, Esq., c.s.,
J. B. Knight, Esq.,
Manockjee Rustomjee, Esq.,
J. G. Bowerman, Esq.,
H. Clarton, Esq.,
C. Lazarus, Esq.,
Babu Issurchunder Ghosal,
Babu Jadoo Lal Mullick,
Babu Persad Das Mullick,

W. M. Souttar, Esq., c.s., *Secretary.*

RULES.

OBJECT.

I.—The object of the Association is to promote the development of Social Science in the Presidency of Bengal.

MEMBERSHIP.

II.—Any person who pays an annual subscription of twelve rupees, or a life subscription of one hundred rupees, shall be a member of the Association.

III.—Every member shall have the right of attending and voting at the annual, quarterly, and special meetings of the Association, of being eligible to any of its offices, and of receiving a copy of its Transactions.

IV. The annual subscription shall be payable in advance on the first day of January in each year.

V. Any member whose annual subscription shall not be paid before the end of the year for which it is due, shall be liable to have his name struck off the list of members by the Council. When a member of the Association proceeds on a temporary visit to England, he shall not be considered thereby to have resigned his membership, unless he communicates his intention to do so in writing; but if absent for more than six months, he shall not be called upon to pay a subscription for any year during which he may be so absent.

VI. Any member desirous of withdrawing from the Association must communicate his wish to the Secretaries in writing, but he will be liable for the subscription of the year in which such communication is received.

VII. Upon the nomination of the Council, persons eminent for their knowledge of Social Science, or who have rendered important services to the Association, may, at an annual meeting, be elected honorary members of the Association. Honorary members shall have the same privileges as ordinary members, and they shall be exempted from the payment of an annual subscription.

OFFICERS AND GOVERNMENT.

VIII. The Association shall have a President, two Vice-Presidents, and two Honorary Secretaries, who are also Treasurers.

IX. The Association shall be governed by a Council, consisting of fifteen ordinary members, besides the above office-bearers. The Council may fill up vacancies in its own body as they occur during the year.

X. All office-bearers and ordinary members of Council shall be elected at the annual meeting, and shall hold office till the annual meeting next ensuing; they shall be eligible for re-election. (This rule shall apply to all officers elected by the Council during the year.)

XI. The Council shall ordinarily meet once a quarter, and when specially summoned together by the President of the Association, or at the requisition of any five members of the Council.

DEPARTMENTS AND SECTIONS.

XII. The Association shall be divided into four departments: the *first*, for *Jurisprudence and Law;* the *second*, for *Education;* the *third*, for *Health;* and the *fourth*, for *Economy and Trade.*

XIII. The Council shall divide itself into sections corresponding to the above departments. The President and Secretaries shall be *ex-officio* members of every section. Each section may appoint its own Chairman and Secretary, who, if not already members of the Council under Rule 10, shall have the right of taking part in its deliberations and of voting at its meetings.

XIV. The work of a section shall consist in collecting, classifying, and arranging the papers and information relating to its own department. For this purpose it may associate with itself other members of the Association.

SUB-COMMITTEES.

XV. The Council may also form other Sub-Committees of its body for special purposes, and such Sub-Committees shall also have the power of adding to their number other members of the Association. The President and Secretaries are *ex-officio* members of all Sub-Committees.

MEETINGS.

XVI. The meetings of the Association shall be annual, quarterly, and special.

XVII. The annual and quarterly meetings of the Association shall be held in Calcutta. The former shall be convened by the Council in January of each year, and the latter in the months of January, March, July, and November.

XVIII. Special meetings of the Association may be convened by the Council at such time and place and for such purpose as they shall think fit.

XIX. At the annual meeting of the Association, the President or one of the Vice-Presidents, shall deliver an address, and the general and sectional reports for the past year shall be read.

XX. The quarterly meetings of the Association shall be held for the reading and discussion of papers merely.

SECRETARIAT.

XXI. The Honorary Secretaries shall, by mutual agreement, divide the duties of their office between them, reporting such arrangement to the Council.

ACCOUNTS.

XXII. The accounts of the Association shall be audited by two members of the Association not being members of Council, who shall be appointed at the annual meeting.

XXIII. The funds of the Association shall be lodged in the Bank of Bengal, and cheques shall be drawn only upon the signature of the President (or one of the Vice-Presidents) and one of the Secretaries.

BRANCH ASSOCIATIONS.

XXIV. The Association shall correspond with, and affiliate to itself, Branch Associations established out of Calcutta.

XXV. As a condition of affiliation, Branch Associations shall pay to the funds of the Parent Association a sum of six rupees per annum for each one of their members, in return for which such members shall be entitled to a copy of its transactions, and to the privilege of attending its meetings in Calcutta or elsewhere.

BYE-LAWS FOR THE CARRYING OUT OF RULES XIII AND XIV.

1. The Chairman of each section shall preside at all meetings of the section, whether for the reading and discussion of papers, or for the transaction of ordinary business. The Secretary to the section shall report the proceedings.

2. So far as regards the collection, classification, and arrangement of statistics, and the consideration of communications, each section shall ordinarily be left to work independently of, and without interference by, the Council. But a report of its operations shall be furnished by each section to the Council at the close of every year in time for its incorporation with the annual report of the Council.

3. Each section shall be allowed to incur a contingent expenditure for printing charges, postage, and sundries, not exceeding Rs. 20 per mensem. Proposals to incur a larger expenditure shall be submitted for the previous sanction of the Council.

4. The Transactions of the Association shall continue to be edited as heretofore by the General Secretaries of the Association; but the report of the discussions upon any paper shall be drawn up and furnished to them by the Secretary to the particular section in which that paper was read.

5. If it is thought desirable to print any paper, either wholly or in part, before the meeting at which it is to be read, in order that copies of the paper may be distributed beforehand, and the discussion upon the subject thereby promoted, the section shall make an application to the Council; and if the printing be sanctioned, the paper shall be made over to the General Secretaries for that purpose.

REGULATIONS REGARDING PAPERS.

1. With a view to direct the communications of members and others into the most useful channels, the Council have drawn up certain heads of enquiry in each department. But it is not intended to confine discussion to these particular subjects; papers on other interesting topics which may occur to individuals, will also be accepted by the Council.

2. All papers should be sent to the Honorary Secretaries at the Metcalfe Hall, at least one month before the meeting at which they are to be read. On the first page of every paper

should be written the subject, and the name and address of the author.

3. As a rule, all papers shall be submitted by the General Secretaries to the section which they may concern, upon whose recommendation alone they shall be accepted by the Council, provided that, in special cases in which the President may think it conducive to the interests of the Society, he may, on the inspection of a paper, exercise his discretion in accepting it without previous submission to the section.

4. A paper will ordinarily be read by its author, or by some friend nominated by him for the purpose; failing such, it will be read by the Secretary in the particular department which it concerns.

5. Papers, when read, should be left with the Secretary to the department, by whom they will be returned to the General Secretary.

6. No paper already published can be read. No paper which has been accepted can be published privately, except by permission of the Council.

7. The Council may print any paper either in whole or in part, or may exclude any paper altogether from the Transactions, as they see fit. Members of the Association will be entitled to twenty spare copies of any papers which they may contribute.

8. All papers should be composed in as clear and concise a style as possible. They should be confined, as far as practicable, to the relation of facts and observations bearing upon the question, and should avoid, as far as may be, the enunciation of general principles and of philosophical theories and reflections. It is quite true that the promotion of Social Science demands that deductions should be drawn from ascertained facts, but it is believed that the requisite *data* have not yet been accumulated, and that the Association will, for the present at least, be most beneficially engaged in the collection of Social Statistics.

9. With a view to preserve the object with which general meetings of the Association are held,—*viz.*, the discussion of the subjects which may be then introduced,—no paper shall be read *in extenso* which will occupy more than a quarter of an hour in the reading, but in the event of the paper being longer, a *precis* or abstract shall be read instead. Such abstract shall be submitted for the approval of the Council, together with the original paper.

REPORT OF THE COUNCIL

FOR THE YEAR 1870.

THE last Annual Meeting of the Association was held at the Town Hall, on the 10th February 1870. Dr. Norman Chevers, the late President of the Association, delivered an address. An important rule was passed at this Meeting, authorizing the election of Honorary Members; and Miss Florence Nightingale, Miss Mary Carpenter, and the Hon'ble Mr. Justice Phear were elected the first Honorary Members.

The Quarterly Meetings were held in February and March last. The first of these Meetings was held at the Town Hall on the 11th February, when Babu Peary Mohun Mookerjea, a zemindar of Ooterparah, read a paper, in the Section of *Economy and Trade*, on the Condition of the Bengal Ryot. He was followed by the Rev. J. Long, who contrasted the present social aspects of Calcutta and Bombay. The Meeting was adjourned till the 28th of February, when the business of the *Education* Section was commenced. The Rev. K. M. Banerjea read a paper on the merits of the different systems of transliteration of Indian names of persons and places; and the Secretary to the Section read, in the absence of the author, a paper on the subject of a popular literature for Bengal. The next Quarterly Meeting was held on the 31st March, when Mr. A. P. Howell, of the Civil Service and Under-Secretary to the Government of India in the Home Department, delivered an address on Primary Education, entitled "Some Remarks on the National Education League."

The above papers, together with the address of the President at the Annual Meeting, were published during the past year in a number of the Transactions of the Association, forming Vol. IV.

In June last, Miss Florence Nightingale favoured the Association with an elaborate paper on the question of Indian Sanitation, which has also been published in the above number of the Transactions. Agreeably to her wishes, the paper has been translated into Bengali, and will shortly be ready for publication. The Council take the opportunity to tender their cordial acknowledgments to the distinguished author for her most practical suggestions on a vitally important subject. They are glad to announce that the paper has also been translated into the vernacular at Bombay for circulation in that Presidency.

The number of Members of the Association is 219, of whom 14 are Life Members, and 3 Honorary Members, leaving as Paying Members, 202.

The financial position of the Society is very satisfactory. The sum of Rs. 1,641 was realized last year for ordinary subscription of Members, and Rs. 1,200 for life subscription; besides, a donation of Rs. 103-15-6 was received from Miss Florence Nightingale. The sale of the Transactions yielded Rs. 360, and the receipts for postage Rs. 17, making a total income of Rs. 3,321-15-6. The expenditure for the year aggregated Rs. 1,626-10-9. The surplus receipts have been invested in Four Per Cent. Government Securities for Rs. 3,000, leaving a balance of Rs. 861-5-0 at the close of the year for current expenditure. The amount remaining to be collected is Rs. 1,663, and the amount of liabilities is Rs. 59.

Several donations of books have been received to the library of the Association from the several Governments, and from Miss Carpenter, to whom the best acknowledgments of the Association are due.

The Council beg to announce with sincere regret the resignation of the offices of Joint Honorary Secretary, and of President of the Association, by Mr. H. Beverley and by Dr. Norman Chevers, respectively. To both, the Association is deeply indebted for its present prosperous and influential position, and the Council take this opportunity of tendering them the warmest thanks of the Association for the interest taken by them in its well-being, and for the valuable services rendered by them.

On the resignation of Mr. Beverley, Mr. A. M. Broadley, of the Bengal Civil Service, was elected Joint Honorary Secretary. Soon after his appointment, however, that officer left Calcutta, and his place has been supplied by Mr. T. J. Chichele-Plowden, of the Bengal Civil Service.

Dr. J. Ewart has been unanimously elected by the Council to fill the office of President in the room of Dr. Chevers, which he has kindly consented to accept.

PEARY CHAND MITTRA,
T. J. CHICHELE-PLOWDEN,
Hony. Secretaries.

CALCUTTA,
The 25th January, 1871.

		Rs.	A.	P.
To Balance in the Bank of Bengal on 1st Jan. 1870		2,127	12	6
,, ,, of Cash in hand on do. do.		11	4	9
,, Subscription for 1867	Rs. 108			
,, ,, ,, 1868	,, 111			
,, ,, ,, 1869	,, 501			
,, ,, ,, 1870	,, 1,428	2,181	0	0
,, Life Subscription...		1,200	0	0
,, Donation received from Miss Florence Nightingale		103	15	6
,, Transactions account		360	0	0
,, Postage account		17	0	0
Total, Rs. ...		6,001	0	9

		Rs.	A.	P.
By Printing and Advertisement		296	11	0
,, Subscriptions written off as irrecoverable, *viz.*—for 1867	Rs. 108			
,, 1868	,, 132			
,, 1869	,, 300	540	0	0
,, Transactions account		452	12	0
,, Establishment charges		625	10	3
,, Postage account		47	11	6
,, Stationery and petty charges		123	6	0
,, Library account		32	0	0
,, Meeting charges		48	8	0
,, Government Securities purchased		2,973	1	0
		5,139	11	9
,, Balance of Cash in hand ...	Rs. 16 12			
,, ,, in the Bank of Bengal	,, 844 9	861	5	0
Total, Rs. ...		6,001	0	9

ASSETS.

		Rs.	A.	P.
Balance of Bills for Subscription for 1868 ...		64	0	0
,, ,, ,, ,, ,, 1869 ...		399	0	0
,, ,, ,, ,, ,, 1870 ...		1,200	0	0
1 Govt. Promissory Note No. 017082 of 1842-43, @ 4 per cent., for ...	Rs. 2,000			
1 Govt. Promissory Note No. 032466 of 1865, @ 4 per cent., for ...	,, 1,000	3,000	0	0
Total, Rs. ...		4,663	0	0

LIABILITIES.

	Rs.	A.	P.
Salary of establishment for December 1870 ...	54	0	0
Due to Messrs. Newman & Co. for stationery ...	5	0	0
Total, Rs. ...	59	0	0

H. M. RUSTOMJEE,
RAJENDRA NATH MITTRA, } *Auditors.*

NILMONEY DEY,
Asst. Secretary.

BENGAL SOCIAL SCIENCE ASSOCIATION.

ADDRESS

BY

DR. JOSEPH EWART,

PRESIDENT OF THE ASSOCIATION.

[Delivered on the 2nd February, 1871.]

YOUR EXCELLENCY, LADIES AND GENTLEMEN,

As it is the custom for the in-coming President to inaugurate his assumption of the office to which he has been elected through the confidence and good will of his colleagues, by delivering an address, I shall endeavour to conform to the rule to the best of my ability. To have been able to dispense with this duty would have been congenial. But my own inclinations must be subordinated to the paramount claims of usage. My position, however, is one of extraordinary difficulty, following, as I do, two such able men as the Hon'ble Mr. Justice Phear and Dr. Norman Chevers, both distinguished for erudition, originality, eloquence, and philanthropy and humanity of the highest order. Still, though in the comparison I must stand at a disadvantage, I have, nevertheless, ventured to string together a few thoughts on two subjects intimately associated with the social advancement of mankind. Before proceeding to do so, permit me to tender my heartiest thanks to the members of the Social Science Association for the compliment offered in selecting me as their President, thus bestowing an honor as unexpected as it has been unsolicited and unmerited.

My first theme is *the Doctrine of Life*—a doctrine which, in all ages, must have engaged and agitated the minds of men. Before the discovery and skilful application of the microscope, and prior to the ingenious philosophical experiments of Francesco Redi, in 1668, the theory of "spontaneous generation," or the theory of the reproduction of living from non-living matter, or as Professor Huxley has termed it, "abiogenesis," was almost universally accepted by all classes of learned and unlearned men. It was then believed that the appearance of plants, under improved conditions of previously neglected soils, was the result of some occult combination of the elements of which they are composed, brought about independently of pre-existing living matter. Thus the new flora which was observed to spring up in place of the primeval forest which had been cut down for the purpose of supplying timber or fuel for the uses of man; or the clover and other species of plants and grasses which follow the drainage, reclamation, and cultivation of comparatively barren and waste lands,—were regarded as the products of spontaneous generation, or abiogenesis. Nay the development of infusoria, or of larger insects in water, or on meat undergoing putrefactive decomposition, was viewed as an exemplification of the generation of living from non-living matter. But we now know from the progressive advancement of science, and the enlargement of our means of observation in the shape of the microscope, that the new flora which succeeds the felling of the ancient forests; that the living beings which spring from organic infusions placed under favourable circumstances of light, heat, moisture, and atmospheric air or oxygen; and that the insects developed and reared in the early stages of their existence on decaying animal matter,—arise from germs themselves derived from parents which had preceded them. So tenacious were our ancestors, down to the seventh decade of the seventeenth century, of the notion that abiogenesis was a law of nature, and that the appearance of maggots and the metamorphoses of insects, generally, were recognised as instances supporting the hypothesis.

When the fallacy of the theory was demonstrated by Redi, so far as these reproductions were concerned, the extraordinary phases of some of the Entozoa, and other species of invertebrata, were still considered to represent an impregnable stronghold for the refuge of the abiogenic school, and to be altogether inexplicable on any other hypothesis than that of independent or spontaneous generation. The researches of Steenstrup and Kuchenmeister, and the consequent establishment of the law of "the alternation of generations," have successfully assailed this fortress, and demonstrated the fact, that the method of reproduction of these animals is in strict conformity with the ordinary rule now shown to prevail universally, wherever the assisted vision can be brought to bear upon the investigation of biogenesis.

The germ of the *Medusa aurita,* frequenting in great abundance the coasts of Great Britain, is first recognised as a nucleated cell or bioplast, provided with locomotive cilia by means of which it can transport itself to a suitable distance from its parent. When it succeeds in discovering a favorable habitation, it attaches itself to any hard and fixed substance in the shallow bed of the ocean, and then becomes elongated. The ciliary processes or locomotive organs being now no longer required, become atrophied, and subsequently dispensed with altogether, whilst the body of the animal undergoes enlargement in all directions. In the third stage, the lower position becomes constricted, and a series of tentacula are developed from the upper and expanded part of the creature. These arm-like processes represent prehensile organs. They are used for the seizing and collection of food. The animal, during this stationary period of its career, presents all the appearances and habits of a hydraform polype. At this period, buds are frequently developed, which eventually undergo detachment, and each of these assumes an independent career. The further growth of this young Medusa is characterized by rapid increase in length, wrinkling or corrugation of its stem, and by proportionate multiplication of the prehensile tentacula. Then the margins of these corrugations assume a notched appearance, so that the animal resembles a pile of jagged saucers placed upon one another, the highest saucer being surmounted by a crown of tentacles. As this developmental process advances to completion, these saucer-like divisions are separated, and each becomes subsequently formed into a perfect Medusa, endowed with considerable powers of locomotion.

In the *Sarsia,* reproduction is also effected by means of germs which pass through a series of gradations, similar to those of the *Medusa aurita.* In its polypoid stage, instead of the final act of development being accomplished by a division of the substance of the whole body into a series of segments, each of which eventually becomes converted into a perfect prototype of its primary progenitor, the young brood spring from the trunk of what was formerly regarded as a mere hydra-tube, by a number of budding processes, which, in course of time, drop off and grow into medusiform animals.

Professor Von Beneden has shown that an analagous mode of generation is illustrated in the reproduction of the cestoid worms. The cystic worm (scolex) in its quiescent condition, and securely ensconced within the tissues of another animal, corresponds with the simple hydra-form polype. The compound animal, in the shape of the tapeworm, infesting the alimentary passages of another animal (strobile), is analagous to the elongated polypoid creature undergoing gradual division into segments. And the mature separate segment (proglottis) is, biogenetically, comparable to the active *Medusa aurita.* The experiments and philosophical investigations of Kuchenmeister and others have reduced these opinions to positive demonstration.

To facts such as these, we owe the enunciation of the law of the "alternation of generations" by Steenstrup, who defines it as follows:—" The fundamental idea of the words 'alternation of generations' is the remarkable, and till now inexplicable, phenomenon of an animal producing an offspring, which at no time resembles its parent, but which, on the other hand, itself brings forth a progeny, which returns in its mature form and nature to the parent animal, so that the maternal animal does not meet with its resemblance in its own brood, but in its descendants of the second, third, and fourth degree of generation. And this always takes place in the different animals which exhibit the phenomena in a *determinate* generation, or with the intervention of a determinate number of generations. This remarkable *precedence* of one or more generations, whose function it is, as it were, to prepare the way for the later succeeding generation of animals destined to a higher degree of perfection, and which are developed into the form of the mother, and propagate the species by means of ova, can, I believe, be demonstrated in not a few instances in the animal kingdom."

When our investigation is prosecuted to the utmost extent possible at the present day, the great doctrine of Redi—*omne vivum e vivo*—receives confirmation rather than refutation. But just as this doctrine was attacked, when objects of less than the $\frac{1}{400}$th of an inch could not be measured and described, so is it now assailed in that vast field of nature tenanted by an uncountable number of living organisms measuring less than the $\frac{1}{100000}$th. of an inch in diameter.

A century ago, when portions of living matter, of dimensions smaller than the $\frac{1}{400}$th of an inch, could not be seen by the aided vision, the advocates of spontaneous generation or abiogenesis assumed that the animalculæ and fungi, which sprang from organic infusions, originated independently of the presence of pre-existing living germs. But, in recent times, the improvements in the construction of magnifying powers have enabled us to clear up much of this previously unexplored region, and the result has been the discovery of innumerable germs, or specks of living matter, measuring less than the $\frac{1}{100000}$th of an inch in diameter, identical, in every particular, in composition, habits, and powers of development, growth, and reproduction, with the parents from which they have been derived, either by a process of biogenesis, or by the law of the "alternation of generations." So that it may now be affirmed that, as far as microscopical investigation—which has already covered a field of research and observation hitherto unparalleled—has enabled the pioneers of physical science to penetrate into the mysteries of biology, the doctrine of biogenesis has, without exception, met with the most irrefragable support, whilst the advocates of abiogenesis have been driven to seek refuge in reasoning and the region of the *invisible.*

Dr. H. Charlton Bastian, in his comments on Professor Huxley's remarkable Address read at the last meeting of the *British Association for the Advancement of Science*—an address in which the doctrine of biogenesis was most ably handled—observes that the Professor "does not attempt to deny—he does not allude to the fact—that *living things may and do arise as minutest visible specks in solutions in which, but a few hours before, no such specks were to be seen.* And this," continues Bastian, "is in itself a very remarkable omission. The statement must be true or false, and if true, as I and others affirm, the question which Professor Huxley has set himself to discuss is no longer one of such a simple nature as he represents it to be. It is henceforth settled, so far as visible germs are concerned, that living things can come into being without them. It can now, at all events, be said that *some* living things do not come from *visible* germs. Who, therefore," asks Bastian, "in the face of this fact, will say that the doctrine—*omne vivum e vivo*—remains unshaken ? " This line of argument is devoid of novelty.

It is precisely the same as has always been adopted by the abiogenic school. It is identical with that which was preached by the opponents of Redi's doctrine immediately after its promulgation, and which continued to be utilized, as each position of refuge was tkaen up and abandoned in consequence of the demonstrated extension of the foundations on which biogenesis is based. It has never been denied that "multitudes of minute living things may, and do gradually, appear in fluids, beneath the microscope, where no visible germs previously existed." It has only been asserted that there may be vast numbers of living germs, which, owing to their almost atomic minuteness, have never been observed by the aid of the highest magnifying powers which have as yet been invented. But just as within a range or domain of assisted vision represented by microscopes, magnifying objects to such an extent that living matter varying in size from the $\frac{1}{400}$th to the $\frac{1}{1000000}$th of an inch in diameter can be brought under ocular observation, there is reason to believe that, when a still greater magnifying power is commanded, germs which are now *invisible*, and therefore regarded by Bastian and his followers as possibly originating, *de novo*, in obedience to the hypothesis of abiogenesis, will be laid under contribution in corroboration of the all-pervading law of biogenesis. The burden of proof, doubtless, rests as much with the one side as with the other. It is not easy to understand how the undisputed fact "that living things may and do arise in minutest visible specks in solutions in which, but a few hours before, no such specks were to be seen," in any way materially affects the question at issue in favour of the theory of spontaneous generation. But what has, to my mind, been successfully combatted, is the assumption that,—because minute specks of living matter appear in the field of the microscope, in solutions which are, to our imperfectly aided vision, homogeneous, or destitute of visible particles,—these are originated, *de novo*, from matter devoid of vitality and the reproductive properties appertaining to living things.

The biogenic school, in discussing this question, are free to admit that "the subject is one in which direct demonstration must give place to reasoning," although experiment and observation may and must be brought forward in support of this; because, so far as scientific investigation has yet proceeded, the reasoning and experimental demonstration cannot be said to be opposed to their cause. For there is every logical reason to believe that, as the present aids to man's vision are further improved and amplified, living matter, which cannot at present be observed, owing to the limitation of our means, will eventually be subjected to visible examination. All precedent is in favor of this view. Suppose, for the sake of example, that a microscope were invented possessed of such a magnifying power as to render objects of less than the $\frac{1}{1000000}$th of an inch in diameter visible, do not reasoning, analogy, precedent, and experiment go to support the opinion that such an instrument would bring into view a vast population of organisms, germs, and living beings inhabiting an extensive region hitherto unexplored, and which, for want of adequate means, have never been observed by man in their early biological career? If so, then are not the supporters of biogenesis entitled to contend that living things do not arise *de novo?* For, as is admitted by Bastian, " in 999 cases out of a thousand "—he might have said in a thousand cases per thousand—" which come under actual notice there cannot be a question that a living thing originates from a pre-existing living thing." Nor is it doubted that a rule of such apparently universal application is most likely to be the rule which applies to any questionable case. " Much," says Bastian, " is made out of this argument, which is, of course, a very valid one as far as it goes." Now considering that, according to Bastian's own admission, the rule applies to 999 cases out of every thousand known cases of generation, and that as has already been stated, the exception is only to be sought for in regions which are acknowledged to be invisible, most people would have regarded it as unimpeachable, and viewed his assumption, without any satisfactory proof whatever, that living things may appear in minutest visible specks from non-living invisible matter contained in homogeneous organic or colloidal solutions, as problematical in the extreme. When he puts the interrogatory—" Have we not seen, indeed, that the most accomplished biologist, provided with the very best microscopes hitherto made, though he gets down to a minimum *visible* stage of less than $\frac{1}{100000}$th of an inch in diameter, is just as powerless in face of the hypothesis of invisible germs as those who worked with the rude microscopes which alone were in vogue two centuries ago?" he does not seem to recognise the fact that the law of biogenesis has always been reinforced by the revelations which have followed the substitution of the best microscopes of the present day for the rude and imperfect ones used two hundred years ago; and that reasoning from such precedent, and the 999 cases out of a thousand, it is very naturally inferred, that the doctrine will be still further substantiated as our aided vision becomes more and more extended.

Science is greatly indebted to Bastian for the illustrations he has furnished in proof of the wonderful tenacity of life possessed by the minutest forms of living matter. He exposed organic fluids to a higher temperature than they had ever been subjected to by previous experimenters, in hermetically closed flasks, and in *vacuo,* and yet he found, after a time, that organisms made their appearance in them. But his conclusion, that these vitalized productions originate, *de novo,* by a re-arrangement of the elements of which they are composed, from dead matter, is open to question. Because the theory propounded by him, to the effect that all life had been extinguished in the germs suspended in these fluids by exposure to such an elevation of temperature and exclusion of the atmosphere, is not proven. We are not as yet in a position to declare at what temperature the influence of life ceases in some of the lower forms of pre-existing living matter; nor can we say, with exactness, how long the germs of the lower orders of animalcules and plants may lie dormant, when altogether excluded from the vivifying power of the atmosphere, until, under favoring circumstances, the active processes of life may be again manifested.

It is, however, well known that the lowest forms of living matter are endowed with marvellous powers for resisting the extremes of heat and cold, and averting absolute extinction, as living organisms, before they have succeeded in perpetuating the species to which they belong. Here, we cannot fail to note the great purpose which these beings fulfil in the economy of nature. But for their ceaseless development, growth, and reproduction, the total conversion of living into non-living matter, or organic into inorganic compounds, would, in course of time, become an accomplished fact; and the vegetable and animal life covering the earth, and abounding in the atmosphere and in the ocean, would become a thing of the past. These organisms live and thrive on the confines where the scenes of the transition of organic into inorganic matter are to be demarked. Whether visible to the aided vision, or invisible under the highest powers which have hitherto been employed, their great function is to prevent the transition from being completely effected, by assimilating to themselves matter from both the organic and inorganic kingdoms, and to fit themselves to be utilized for the nutrition and maintenance of other beings of a more elevated type and organization. Just as the little polypes, which build up the great coral reefs in the bed of the sea, are most active and resistless, where the danger is at its maximum, or where the reefs are most exposed to the waves of the stormy deep, and succeed in presenting an effective barrier against the encroachments of the ocean, so that the little tiny, gelatinous-looking builders may be allowed to proceed in their work of raising up vast masses of coral rock without molestation, so do these minute forms of animal life pervade every part of the globe, the atmosphere, and the waters of the great deep, where the change from organic into inorganic matter is most imminent, or going on most rapidly with a view to put a limit upon this metamorphosis of matter, and to refit it, under the operation and influence of the wonderful something or property or principle of matter, which we are pleased to call life, for the nutrition of their own miscroscopical bodies and the continuation of the species. So minute are many of these beings that they cannot be observed by the best aids to vision hitherto invented. If, therefore, it must be conceded that these creatures are so small that our best powers fail to make them visible, how incomparably smaller must be the germs of living particles which effect the reproduction of the race. But though they are so small, the important functions which they perform, are secured by the vastness of their numbers. The immense accumulation of life represented by these uncountable billions of living beings may be imagined, when it is stated that the existence and perpetuation of the visible fauna and flora of the globe are mainly dependent upon their ceaseless activity, development, growth, and unfailing reproduction.

That Bacteria spring from the minutest specks, which appear in homogeneous organic solutions where no specks could previously be observed, is unquestionable. "Being motionless and diffused," says Bastian, "their number cannot be accounted for by any supposed rapidity of multiplication—the only possible explanations seem to be, either that the specks have originated from as many pre-existing germs which were invisible, or else that they have proceeded from material collocations which have been initiated in the fluid itself by virtue of the molecular properties of the substances in solution, and the physical forces, or sum total of conditions acting thereupon." Coinciding with Bastian in the opinion that this is really the question which has to be disposed of, every upholder of biogenesis is, nevertheless, at issue with him as regards the conclusion at which he has arrived, because the best aids to vision do not enable us to watch the progressive changes undergone by invisible germs. Once, however, they become visible, under favoring conditions of heat, moisture, and temperature, their further development and growth can be examined and determined with facility. There is no good necessity shown for admitting that the beings which spring from solutions exposed to great and prolonged heat, or contained in hermetically-closed flasks, have originated independently of pre-existing germs. This being the state of the case, there is no valid reason for making much of Bastian's admission that "similarly such specks are the only forms of living matter which are supposed to be capable of arising *de novo.*" Before he can claim support for the hypothesis of abiogenesis, it is incumbent upon him to satisfy his opponents that the temperature to which he subjected organic solutions was sufficiently high to prove absolutely fatal to all the living matter or germs contained therein; and that his means and appliances were so perfectly adjusted and arranged as to ensure the exclusion of the atmosphere, which, as Pasteur and Tyndall have demonstrated, is, under almost every conceivable condition and circumstance, known to be abundantly charged with both visible and invisible germs. I submit, that until this is done, there is no reasoning which is sufficiently potent to warrant the abandonment of Redi's doctrine—*omne vivum e vivo,* or as the immortal Harvey puts it—*omne vivum ex ovo.*

"But if," says Huxley, "in the present state of science, we are offered the alternative either of believing that germs can stand a greater heat than has been supposed, or that the molecules of dead—for no valid or intelligible reason that is assigned—are able to re-arrange themselves into living bodies, exactly such as are produced in another way, I cannot understand how our decision can be, even for a moment, doubtful. In expressing this conviction, I must, nevertheless, guard myself against the supposition that I intend to suggest that no such thing as abiogenesis has occurred in the past, or will in the future. I think it would be the height of presumption for any man to say that the conditions under which matter assumes the properties we call 'vital,' may not some day be artificially brought together. All I feel justified in affirming is that I see no reason for believing that the feat has been performed as yet. And looking back over the past, and finding no record of the commencement of life, I am devoid of any means of forming a definite conclusion as to the conditions of its appearance. Belief in a scientific sense is a serious matter and needs strong foundation. To say that I have any belief as to the mode in which the existing forms of life have originated would be using words in a wrong sense. But expectation is permissible where belief is not; and if it were given to me to look beyond the abyss of geologically recorded time to the still more remote period when the earth was passing through physical and chemical conditions, which it can no more see again than a man can recall his infancy, I should expect to be a witness of the evolution of living protoplasm from non-living matter. I should expect to see it appear under forms of great simplicity, endowed, like existing fungi, with the power of determining the formation of new protoplasm from such matters as ammonium, carbonates, oxalates and tartrates, alkaline and earthy phosphates, and water, without the aid of light. That is the expectation to which analogical reasoning leads me; but I beg you once more to recollect that I have no right to call my opinion anything but an act of philosophical faith. With these limitations, Redi's great doctrine of biogenesis appears to be victorious along the whole line at the present day."

To regard the numerous species of animals and plants now clothing and ornamenting the globe as having been originated *de novo*, at some remote period of the world's history, by chance, accident, fortuitous or spontaneous generation, without the intervention of the agency by which matter itself must have been made or created, is simply to countenance the grossest materialism, and to strike at the very foundations of religious faith. Fortunately, as has been shown, the data upon which it has been attempted to support such a doctrine as this, may, with truth and justice, be utilized to uphold a totally opposite conclusion. For a preponderating balance of scientific testimony is favorable to the doctrine of biogenesis; and, if time be only conceded, it may still be confidently contended that natural science and religion are in no sense antagonistic or irreconcilable.

In every department of animated nature, the scientific investigator has, wherever vision and sound reason have been permitted to have full sway and fair play, succeeded in revealing examples of Contrivance and Design. Whether his investigations have been carried on in a domain within, or altogether beyond the range of aided vision, or in regions where reason supported by analogy and precedent is alone available, the rule is maintained with unswerving fidelity. Not only is this so in the animal and vegetable kingdoms: in the formation of the rocks, in the constitution of the crust of the earth, the ocean and the atmosphere, and in the ceaseless changes to which these are subjected, we observe the operation of laws, which, like matter itself, were originated, and are now regulated and directed by an omnipotent central power. Thus, in the inorganic kingdom, properly so called, in the construction and habits of the flora and fauna of the globe, we everywhere "see the strongest evidence of Design, and amidst much apparent difference of form and obvious diversity of purpose, the biologist recognises a remarkable unity of plan, affording incontestable proof that the whole was devised by One Mind infinite in wisdom, unlimited in resource."—*Beale.*

My next theme is *the urgent necessity for the introduction, into the schools preparing students for the Entrance Examination of the University of Calcutta, of the study of the rudimentary principles of Natural and Physical Science.* The grand defect in the general educational system of India is the almost total absence of the means of teaching this department of science. Yet the man must be blind, indeed, who does not recognise the wonderful revolutions and changes which have been effected in the world's history by means of the full development and growth of this kind of knowledge. It is to intellectual and physical training in this direction that we owe the telegraph, the railway, steam communication by sea, and the construction of such works as the Suez Canal and other gigantic engineering undertakings of vast importance to the welfare of the human race. It is to the practical adaptations of such scientific knowledge to meet the wants of civilized man, that England owes much of her greatness and power of doing good. It is owing to the eminence of her sons in the various walks of science, that she is mainly enabled to maintain her high and unrivalled position in the scale of nations. We see the truth of these statements in the excellence of our military and naval armaments, in the development and extension of agriculture and commerce, and in the multiplication and augmentation of our national resources and prosperity. Yet, notwithstanding these patent advantages, is it not strange that no pains should have been taken to introduce the study of Natural and Physical Science into the schools of India, training students to qualify for the Entrance Examination, and that the University system exacts no knowledge of the kind from those who annually appear at this Matriculation Examination?

The reason which has apparently been urged in justification of this exclusion of Natural and Physical Science from the education of the youths of India, is that the University has found very great difficulty in weighing the competing claims of various branches of knowledge and in selecting those which are considered best for general educational purposes. There is, therefore, it is said, a natural reluctance to press the claims of particular studies, the admission of which might involve the abandonment of other studies which, as a means of mental training, have been preferred upon mature deliberation. The advantages to be gained by the teaching of the rudiments of science is not denied. It is feared that the students would not have sufficient time to devote to science consistently with the profitable study of the other subjects laid down in the University curriculum. And it is argued that, as these branches of knowledge are more important for the purposes of intellectual training, science must be excluded accordingly.

It seems to me that the University and educational authorities have never fairly grappled with this question, and that they have not yet realized the length, breadth, and depth of the essentially important object aimed at by such men as Fayrer, Oldham, and Blanford, in their endeavours to have the first principles of science taught in the schools throughout the country. What these gentlemen and those who support them contemplate is simply to have imparted to students, preparing for the Entrance Examination, elementary instruction in Natural and Physical Science, analogous, or approximating, as nearly as possible, to that which is demanded from lads being trained for the Matriculation Examination at the London University,—or at a period or stage of general education of the youth of the country, altogether antecedent to the further stages of professional study, in any of the collegiate institutions affiliated to the Calcutta University. For whilst, to the general run of students, the study of the common principles of Experimental and Natural Science would be of inestimable value in promoting the development, growth, and vigour of the mental faculties and in perfecting the powers of observing and recording facts, it ought, consequently, as has been recommended at home, to take rank with mathematics in the winning of prizes and honors. Constituting further the very alphabet and grammar of the sciences, such training is absolutely essential to those students who, after Matriculation, may determine to pursue the callings of Medicine and Engineering.

Since the Entrance Examination of the University requires no knowledge of Natural and Physical Science, the general education conferred cannot be viewed as adequate to the immediate requirements of professional training. Of the simplest technical terms, or of the causes of the most ordinary phenomena, the students have not the remotest idea. Thus, when, by virtue of having passed the Entrance Examination—which does not even demand the most trifling knowledge in scientific branches of study—the students present themselves at the affiliated institutions for the prosecution of the higher branches of science, they come charged with book-knowledge alone, and without the slightest pretension to any acquaintance whatever with the facts of Physical Science. Their memories have been abnormally developed and cultivated, whilst the faculty of observing and understanding the phenomena of every-day life; of collating certain facts, and deducing from these the true position of cause and effect; or of making practical use of the eyes and hands which God has given them,—is comparatively dormant, because it has been ignored and neglected. Their memories are, therefore, disproportionately developed at the expense of the other equally important faculties of the mind. The result is just what might have been expected—the out-turn of bookworms as the rule, where these ought to be the exception, or the substitution of too much theoretical for practical learning. Page over page of scholastic text-books can be recited to an extent which would appear prodigiously astounding, if the causes producing such a phenomenon were not well understood as the inevitable consequence of the nature and kind of teaching conferred. The limited and superficial character of much of this training is manifest from the fact that, in too many instances, the students are unacquainted with the real meaning of the passages which they can readily spout from Goldsmith, the History of India, and so forth. The evils of such a system of education as this do not become immediately apparent in those gentlemen who resolve to pursue the study of law in the affiliated colleges. But even here the cultivation of the mind is manifestly partial, one-sided, and illiberal. It is devoid of the fertilizing and reproductive elements which are contributed by indoctrination into the principles of Physical Science. There is too much sameness and monotony, whilst the salubrious tendency of a liberal rotation of subjects, in the culture of the juvenile intellect, is unappreciated and overlooked. The education of the entire body of pupils is thus deteriorated to a deplorable extent. But this defect is most unmistakably recognised in those lads who, after Matriculation, elect for the pursuit of the scientific professions.

The instant these young men enrol themselves as candidates for the profession of Medicine or Engineering, it becomes at once apparent that their preliminary education has been quite inadequate to the immediate requirements of professional training. The professorial arrangements, in the engineering and medical schools, for the conveyance of instruction, *after* Matriculation, are in the main excellent and unimpeachable. But it must be manifest that no efforts which the professor of any given subject can make will enable him to compensate for the absolute want of any previous scientific training in the general educational institutions below—a blank which places those students who may select the future study of the sciences collateral to Medicine and Engineering, in the colleges appointed for the purpose, in the same unfortunate position as a freshman of Oxford would be situated, were he permitted to undertake the cultivation of the higher classics without having already mastered the alphabet and grammar of those classical languages. All that is demanded is that medical and engineering students should be sent up to us after they have been drilled in the alphabet and grammar of science.

According to the present state of things, the student's first year's residence at the medical and engineering schools is neutralized by his ignorance of the simplest terms and principles of science. His time, which should be devoted, during the first session, to the complete mastery of the fundamental branches of science, collateral to medicine and engineering, is principally occupied in familiarising himself with the rudimentary principles and the signification of technical terms. He has been suddenly launched into a *terra incognita*, and he is called upon to *combine* scholastic with collegiate instruction, at a period when the university curricula really demand that his whole time should be exclusively devoted to the cultivation of the highest branches of study indicated therein. An amount of labor is thus devolved upon the student, which is incompatible with the attainment of the leading object contemplated by the exactions of the University,—namely, that the time spent in studying Medicine and Engineering should be exclusively employed in receiving professorial instruction in conformity with the standard of our model—the London University. It is as impossible for our students to successfully amalgamate, during their collegiate career, scholastic with professorial learning, as it is for the professor to unite, with his own, the arduous and laborious duties of the schoolmaster. These functionaries have special works to perform. In their respective spheres, the importance of their duties cannot well be over-estimated. Omission or dereliction of duty, on the part of either, is fatal to the soundness and integrity of the edifice they are instrumental in building up. Unless collegiate training begin with a soil, prepared and fertilized to the requisite extent and degree in the lower schools, it must stand at a great disadvantage, and the results must be proportionately imperfect.

It is stated in the University Calendar that, at the Entrance Examination, every candidate shall be examined in the following subjects:—

I.—LANGUAGES.

English, or one of the following languages:—

Greek.
Latin.
Arabic.
Persian.
Hebrew.
Sanskrit.
Bengali.
Ooriyah.
Hindi.
Urdu.
Burmese.
Armenian.

II.—HISTORY.

Outlines of Ancient History, of History of India, and of General Geography, with a more detailed knowledge of the Geography of India, &c.

III.—MATHEMATICS.

Arithmetic.

The four simple Rules; Vulgar and Decimal Fractions; Reduction; Practice; Proportion; Simple Interest; Extraction of the Square Root.

Algebra.

The four simple Rules; Proportion; Simple Equation; Extraction of the Square Root; Greatest Common Measure; Least Common Multiple.

Geometry.

The first four books of Euclid, with easy deduction.

To this list I would add, as soon as it may be deemed practicable to do so—

IV.—NATURAL AND PHYSICAL SCIENCE.

Mechanics; Hydrostatics; Hydraulics; Pneumatics; Acoustics; Optics; Chemistry. Botany and Physiology to be optional.

A small text-book comprising a condensed and intelligible account of the rudimentary principles of these branches of science might soon be prepared. When the important object of this innovation is borne in mind, the additional expenditure that might be involved in introducing the change, scarcely merits much consideration, especially if, as is believed, the duty of conducting instruction in the sciences might, as a general rule, be assigned to the most eligible of the existing educational staff. And since the devotion of a few hours every week to the experimental illustration of scientific principles and laws will, in all probability, be found amply sufficient to convey the amount of knowledge of "common things" required, there need be no fear lest the introduction of the subject of Natural and Physical Science into the system of general education throughout the country should interfere with, much less involve the abandonment of, any other branch of study now considered to be necessary to qualify the student to meet the requirements of the Entrance Examination of the University.

Before concluding this Address, permit me to make a few general observations regarding the objects contemplated in the foundation and maintenance of this Association. Its leading aim is "to promote the development of social science in the Presidency of Bengal." Sociology is a term of comprehensive signification. It is not a mere branch of knowledge. It is not, herefore, to be compared with an ethnological, philological, geographical, geological, meteorological, or any other ogical society, each of which is restricted to the cultivation and advancement of a distinct branch of science. Our Association assumes a more elevated position; and through the industry and philanthropy of its working members belonging to every persuaion of religious faith and branch of science, its cardinal object is to utilize, as far as may be practicable, the entire range of he sciences, with a view to promote the social, moral, and intellectual amelioration of mankind. A society, founded on uch a broad basis as this, and inviting the assistance of ladies and gentlemen of every creed and race, ought to command the confidence and support of all the educated classes of the community. In its ranks, religion or nationality receives no special favor or recognition. The aristocracy of knowledge is alone allowed to demand precedence. It constitutes a social republic or "parliament," in which he who succeeds in doing the best work must inevitably take the foremost place.

In truth, the Bengal Social Science Association, whilst urging no claim to executive or administrative power, nevertheless endeavours to possess a real influence in assisting the development, growth, and diffusion of useful knowledge, and by collecting and classifying facts, in contributing to the formation of a sound and healthy public opinion on questions intimately interwoven with the dearest interests of the people and of those who have been appointed, under Providence, to lead, to guide, and to rule over them. Careful in guarding the interests of the few occupying the vanguard of civilization, and of those entrusted with the administration of the affairs of the Empire, one of its highest principles is, and must continue to be, to consult the welfare, happiness, and prosperity of the many. Hence, wherever physical and mental poverty is to be found, it will be the paramount duty of the Association to make every reasonable exertion to alleviate, mitigate, or remove the blemish, and to substitute in its place, vigorous, physical, and intellectual development and growth.

Whilst striving to facilitate the accomplishment of this grand result, we must bear in mind that "Rome was not built in a day;" and that the material and intellectual progress of India has, during the past two decades, been altogether unrivalled during any corresponding period of its history. Our difficulty, if not our danger indeed, now consists in attempting to force on too rapidly, —and without adequate consideration for vested interests and traditions,—innovations and reforms, somewhat before the people, whom they directly affect, are in a state of educated preparation to receive them. There is scarcely a reform which has been met with a storm of opposition, which, with a little more time, and a very great deal more of education, would not have been accepted with general acclamation and without reservation.

There is an impression sinking deeply into the hearts of all educated men in this country that, with one notable exception, India now needs repose, or a small amount of breathing time. That exception is education, which, though advancing, is, when measured with the wants of the country, only to be likened unto a drop in the vast ocean of ignorance almost everywhere pervading the land. Hence it follows that every well-wisher of India must hail with a hearty welcome the fixed and, I hope, unalterable determination of Government to make an attempt to educate the masses of the population. And if this noble resolution be carried into execution, without starving high class education, if both high and low education be conducted simultaneously, harmoniously, and in co-ordinated order, as they doubtless can and ought to be, without the progress of either being in any way impeded or endangered, but each mutually reacting in assisting the other, the ultimate result will redound to the infinite credit of our rulers, by equalizing as much as possible, and so far as knowledge is capable of doing so, the opportunities of the masses for the attainment of intellectual training and distinction; and prove an enduring monument to the justice and benevolence of Government, as it must prove an everlasting benefit to the teeming millions of men and women owing allegiance to Her Majesty—the Empress of India.

Your Excellency, Ladies and Gentlemen, I have now to tender to you my most cordial acknowledgments for the patient attention with which you have listened to the observations which I, in the fulfilment of rather an arduous duty, have considered it right to make on the present occasion.

JURISPRUDENCE AND LAW.

1.—*On the Examination of Witnesses in Mofussil Courts.*

By Baboo PEARY MOHUN MOOKERJEA.

To any one who is familiar with the working of our courts of justice, the reluctance evinced by every native, educated or uneducated, high or low, to be examined as a witness in court, is a matter of daily experience. This feeling appears to be the more singular as perjury is supposed to be a crime of not unfrequent occurrence in Bengal, and even professional witnesses are supposed to be not very rare. So intense, however, is the general feeling on the point, that advantage is not uncommonly taken of it to satisfy private grudge by enforcing the attendance in court of persons whom the citing party has not the remotest idea of examining as witnesses; and where both the litigant parties are influential men, or where there is a large number of partisans on either side, each party delights in citing as witnesses the friends of his antagonist, how ignorant soever they may be of the subject of litigation. Cases have even been known in which the power enjoyed by suitors in this particular has been used as a means of extortion, and in which people have been only too glad to purchase by a pecuniary consideration, exemption from those troubles and annoyances to which witnesses are, rightly or wrongly, believed to be subject; and cases are still more common of persons absconding from their homes and sojourning in distant places till the danger is over.

Considering all the circumstances connected with the examination of witnesses, we cannot wonder at the intensity of feeling which is thus generally manifested. With some, the bare taking of the name of God with a full knowledge of all the frailties of our nature and with the possibility of making an untrue statement through defective memory or through confusion of ideas, is in itself a sinful act; and though similar considerations do not weigh with the majority of those who hesitate to give evidence in court, there are circumstances enough to make the position of a witness in our courts a repugnant one. The poor witness's danger commences from the very time the summons is issued for his attendance in a cause. With a view to gain time, and to prolong litigation, the suitor takes care that the summonses are not actually served on all the witnesses cited by him, and that at least a few of them are returned to court either with the remark that the witnesses could not be found, or that they had absconded to evade the service of the process,—so that the evidence of a servant of the plaintiff or the defendant, corroborated by the interested testimony of the court peon, might condemn the witness to prison, or subject him to a fine; but fortunately this provision of the law is not always rigidly enforced, and recourse is had to the more lenient procedure of issuing a proclamation for the attendance of the supposed recusant witness. We will not view the witness's position in a worse light than it generally is by supposing that even the proclamation is purposely kept back from his knowledge, and that ulterior measures in the shape of attachment of his property and committal to a criminal court are resorted to. Although these latter measures are adopted in several cases, we will suppose that the proclamation has the desired effect, and that the witness finds himself constrained to attend the court. When he is once in court there is no knowing when his troubles would cease. In more than five cases out of ten the trial is not conducted on the day fixed for the same, but is put off from day to day, and from week to week, for a period which might extend to several months. If the witness lives within a few miles of the court house, and can command cheap and easy means of communication, he can repair to the court daily or on the appointed days from his home, but if he is not so fortunate, he is obliged to reside temporarily in the vicinity of the court house to the detriment of his daily avocations, and exposed to all the inconveniences and privation of a temporary residence in town. If one were to hear the supplications daily made by parties and their witnesses for the trial of cases on the appointed days, one should suppose that our Mofussil judiciary are self-constituted distributors of charity and not of justice, and that they are the masters and not the servants of the public. Happily our courts are daily becoming more cautious and considerate than before in fixing days for the trial of cases, and more punctual in trying the cases on the appointed days.

We shall suppose these preliminary trials to be at an end, and that the witness is fairly in the box ready to undergo his examination. An impression generally prevails in the Mofussil bar that, excepting in criminal cases, the examination of witnesses is a minor task. There is scarcely one case in a hundred in which the pleader prepares himself for conducting the examination of witnesses, or even reads the brief before the case is ripe for argument. The task is usually left to a junior pleader, who carries the witness through his evidence as set down in the memorandum furnished by the mookhtear. While in England witnesses have many motives for stretching their story to the attorney—the love of being important, the desire of being taken to the Assizes and paid for pleasure trips—a witness in this country, on the other hand, tries to make himself as immaterial and unimportant as he can to the suitor and his mookhtear, in the hope of being released from the disagreeable position of a witness. The memorandum of evidence with which the pleader is furnished is, therefore, in many cases, as different from what the witness actually says under the sanction of a solemn affirmation as anything can be. A mass of irrelevant matter is thus introduced into the record of the case, while perhaps the most material points on which the witness could have given his evidence are altogether left out of sight. All that ingenuity and caution that are required in conducting the examination-in-chief—to bring out, for example, statements from a witness who says too little, and to keep another who says too much closely to the points for which he is required; to manage skilfully an adverse witness, and yet not to violate the principle by which one cannot discredit one's own witness—are as a rule practically unknown in the Mofussil courts. Should the witness by mistake make a statement which is damaging to the cause he has been cited to prove, the ignorance of the pleader of the facts of the case disables him from trying to put the witness in the way of refreshing his memory and correcting his error. One great evil of this haphazard way of examination is that it produces disagreement of witnesses in important particulars, for instead of weighing for himself the legal sufficiency or otherwise of the evidence adduced by two or three witnesses to prove a cause, the pleader examines as many witnesses as the party or his mookhtear in his anxiety desires to be examined; and thus instead of the unvarying statement of two or three witnesses, there is usually in the record of a case nine, ten, or even fifteen or twenty statements on the same point, which, from various causes, oftentimes disagree with and contradict one another. It is owing to these apparently trivial causes that the testimony of a witness who may be perfectly honest and truth-telling not only conflicts with the other evidence in a case, but appears to be wanting in that frankness and honesty which require not simply the truth but the whole truth to be disclosed. From the very nature of the examination the testimony is defective on some points and unnecessarily prolix on others, and it is in this position that the pleader leaves the witness to be dealt with by his adversary in cross-examination.

The cross-examining pleader, being usually as ignorant of the circumstances of the case before it is ready for argument as the pleader on the other side, is unable to discern the merits of the questions put to the witness in his examination-in-chief. Several leading and irrelevant questions are asked unopposed in the examination-in-chief, while some introductory questions are perhaps hotly protested against, and when his turn comes he is obliged to proceed on an aimless cross-examination on the statements made by the witnesses without being aware of the bearing which those statements have on the case. Sometimes he contents himself by relying on a set of questions furnished by his client or his mookhtear, the object of which is in many cases to show that the witness is a ryot or a dependant of the party by whom he has been examined; that he has given evidence in different courts half a dozen times, or that he is a member of a hostile village faction. From its very nature the cross-examination which is thus conducted generally partakes of the character termed the *savage* style of cross-examination. Instead of beginning by giving the witness credit for good intentions and trying to elicit the truth by making him believe that he might himself have been deceived, the pleader tries to make out contradictions by confusing the honest and brow-beating the timid. The result of such a course is evident. It kindles defiance in the breast of the witness, places him on his guard, and thus destroys in many cases the only chance of weakening the force of his testimony in favor of the other side. Not one of the least disagreeable consequences of such a treatment in the witness-box in a country where discretion is usually reckoned to be the better side of valor, is to create and confirm that repugnance to give evidence in court which we have noticed at the outset.

The court itself plays no unimportant a part in bringing about the mass of incomplete and unsatisfactory evidence which is usually found in the record of a case. Confident that all the material points would be drawn out by the pleader by his examination-in-chief, and that all irregular questions would be objected to by the pleader on the other side, its sole care generally is to see that the examination of each witness does not take up more time than what is ordinarily allotted to it. But this indifference is comparatively harmless. It is far less injurious in its consequences than the over-zeal, very much akin to a pre-determination of a case before the evidence is closed by both sides, which induces a court to take upon itself the task of conducting the examination-in-chief or the cross-examination, and to humour or to browbeat the witness according to its pleasure. The effect of such a conduct is unmitigated evil, as the court by its very position, and its almost absolute power, can commit an ignorant witness, whether honest or dishonest, almost to any statement which it wishes him to make. The circumstance, however, which exercises the most pernicious influence on the suitors, the pleaders, and the witnesses, and tends in no small degree to debase the national character, is the opinion which the Mofussil courts generally choose to entertain that all persons examined in courts are, with rare exceptions, dishonest witnesses. This opinion not only finds a vent in the judgments of all grades of courts, but also in a most objectionable manner during the examination of witnesses by way of such remarks as these,—"I know very well what you have come to say; " "Do make haste, and finish what you have been taught to say;" "I know full well what weight to attach to the evidence of witnesses in this country." Nothing can be more clear than that this light assumption of dishonesty creates a disgust for courts in the minds of the honest, and a recklessness about untruth in the minds of the wicked. The treatment which the witnesses receive at the hands of the court and of the pleader, and the estimate which is thus hastily and uncharitably formed of their evidence during their examination, would have long convinced suitors of the utter worthlessness of oral testimony in this country, and dissuaded them from examining numbers of witnesses in each case, did not the written judgments of the courts in some measure contradict their oral observations and show that although a court may choose to insult them by discrediting all the witnesses in a case during their examination, yet that, in its written judgment, it generally believes all the witnesses examined on one side, and discredits the evidence of the witnesses on the other. It is not uncommon to find a court state in support of its judgment that a large number of witnesses have satisfactorily proved a certain fact; and it is, therefore, no wonder that suitors should think that there is more weight in the sworn testimony of twelve or fifteen witnesses than in that of two or three only, and that they should compete with one another in enlarging their list of witnesses and in examining a much larger number of them than is, in most cases, necessary. The demeanour of witnesses often furnishes the criterion on which the courts base their decisions as to the credibility of witnesses, and from the vast number of decisions in which this criterion is relied upon, one should suppose that our Subordinate Judges, Moonsiffs, Magistrates, and Deputy Magistrates are all either acute phrenologists, or at least persons who are peculiarly gifted with the power of reading the minute shades of the feelings and emotions from the bare features. Even the merest tyro in the art of judicial investigation thinks himself qualified to discriminate the placid audacity of a professional witness, the embarrassment of falsehood, or the bewilderment of a tutored witness who has lost the chain of his story, from the calm dignity of truth, the flutter caused by the novelty of a court scene, or the hesitation caused by defective memory, and to indite his verdict of belief or disbelief on a witness or a number of witnesses from the expression of their countenance during examination. It is, however, strange that one should find in the decisions of our courts the demeanour of one and all the witnesses examined on one side regarded as truthful, and that of all on the other side as false and embarrassing, as if the party who wins has always the rare good fortune to secure as witnesses persons who are neither embarrassed by the novelty of their position, nor ruffled by the irregular and sometimes insulting cross-examination to which they are subjected, while the cast party has always the misfortune not to be able to procure a single professional witness who can simulate the frank expression of truth, or even an unscrupulous one who can calmly narrate his taught testimony. What more can conduce to lessen the respect due to courts than to find one's sworn statements lightly estimated and wantonly disbelieved? The fact of the appellate court, on a consideration of the documentary evidence and of the probabilities of a case, coming, many a time, to a conclusion, on the credibility of the oral testimony on the one side or the other, very different to that of the court which had the opportunity of marking the demeanour of witnesses, furnishes a sad corroboration of our position. But the anomaly is inevitable in a country where the training for the judicial service is undergone simultaneously with the discharge of its duties, and where an appeal on the merits from the verdict of the court of original jurisdiction is not merely an unobjectionable but a necessary procedure.

The way in which the evidence of witnesses is recorded is also not free from objection. In taking down the testimony of witnesses the one sole aim of the court and of its amlah should be to take down the evidence as much as possible in the language of the witness. Owing, however, to the unhappily wide difference which exists between the spoken and the written language of the natives, and owing, moreover, to a desire on the part of the court and of its amlah to record the evidence in what they suppose to be correct language, instead of in the coarse but graphic colloquial in which it is usually delivered, that which the witness says appears in a materially modified form in the record, while the time taken in chastening the language of an answer to a question and writing it down, enables a dishonest witness to draw upon his imagination for explanations on points in which he has been well nigh pushed in cross-examination to the verge of a contradiction. It is well known, moreover, that, in many cases, the only safe criterion whereby to detect taught testimony consists in the difference of the language of the tutored witness to that of one who makes an *extempore* statement. This criterion is, however, altogether lost under the system of recording evidence which obtains in the Mofussil, and the evidence of the taught witness usually appears on paper in an aspect very different to that in which it is viewed by those who happen to mark his language during examination. The case is still worse in the criminal courts. The above remarks apply with double force in criminal cases in which the evidence of witnesses is not taken down in the language in which it is delivered, but only the substance of it in a foreign language. The translations being effected by first impressions by gentlemen who, whatever their qualifications in other respects, are generally very indifferently acquainted with the idioms and phrases of the language in which the witnesses are examined, their fidelity is always doubtful; and there being no record of what the witnesses actually say, they may be construed, at least in the appellate court, to say a thing very different to that which they did really say.

Nothing can be more deserved than the high encomium which is usually passed on the ability, honesty, and independence of the members of the Mofussil bar and of the gentlemen who preside over the Mofussil courts. But our highest tribunals are still as loud as ever in their expressions of displeasure at the manner in which the evidence of the witnesses is taken in the Mofussil, at the mass of irrelevant matter which is generally allowed to be introduced into the record as legal evidence, and at the unscientific and sometimes wanton manner in which the estimate of conflicting oral testimony is made. Amid progress and improvement on every side, the mode of examination of witnesses still continues a standing reproach; and while by the spread of education orthodoxy in religious and social questions is gradually giving way to more liberal ideas, the reluctance to be examined as a witness in court is daily getting a greater hold on the mind of every Hindoo.

EDUCATION.

1.—*The Improvement of Indian Women: by* BABU KESHUB CHUNDER SEN.

[Delivered on 24th February 1871.]

MR. PRESIDENT, LADIES, AND GENTLEMEN,—

In order to estimate aright the social and domestic economy of the Hindus, it is necessary to take into account not only their present condition, but also their earlier history. For the Hindus are not a nation of yesterday; they boast a most ancient and glorious civilization. What we see around us to-day is a fallen nation—a nation whose primitive greatness lies buried in ruins. Its national literature and science, its theology and philosophy, its industry and commerce, its social prosperity and domestic simplicity and sweetness, are almost numbered with the things that were. As we survey the mournful and dismal scene of desolation—spiritual, social, and intellectual—which spreads around us, we in vain try to recognize therein the land of Kalidas, —the land of poetry, of science, and of civilization. In order, therefore, that we may understand the real character of the Hindus, in order that we may practically ameliorate their condition, it is necessary to have a correct knowledge of the social institutions and customs which existed in ancient times in this country. A right knowledge of the early history of India will supply a permanent and strong basis upon which to uprear national civilization. Now that the surges of a most aggressive civilization from the West are beating against native society, it is expedient that all social reformers should endeavour to steer clear of the "Scylla and Charybdis" of opposite extremes. Indeed, there are some who believe that the best way to reform India is to supplant and destroy all that is native, and to introduce Western civilization in its entirety and fulness. There are, on the other hand, those who try to drive back the tide of Western civilization, and always protest against everything European and foreign. In my humble opinion, the elements of oriental and occidental civilization should, as far as possible, be blended together, and neither should be rejected. In spite of her shortcomings and wants, India seems to me to occupy at the present moment a most advantageous position in regard to her future advancement and reformation. Behold her sitting at the confluence of two mighty rivers, and gathering the priceless riches of truth which are flowing down the streams—the products of Eastern civilization and Western thought, of ancient wisdom and modern enterprise. All that is great and good in ancient Asia and modern Europe seems to be coming through these different channels for the benefit of our great country. It is necessary that we, natives of the soil, should take advantage of this circumstance. Whether we undertake the religious, or social, or intellectual advancement of the country, we should consistently avail ourselves of both these sources of improvement. It is our duty and our interest to preserve all the valuable truths, all the wholesome social customs and institutions which belong to our country, and at the same time gratefully to accept all that is offered to us by Western nations. The battle which was strenuously fought here some years ago between the Anglicists and the Orientalists in the sphere of education, and which at last ended in a compromise, has, I believe, to be fought in every department of native improvement, and must be similarly decided. You are, no doubt, aware how that great controversy has been finally settled by the educational authorities. The Government and the Universities are now trying to afford facilities to the study of Sanskrit, while at the same time the greatest encouragement is given to the cultivation of English literature and science. If we are at all sincerely anxious to promote the true advancement of our country, we should adopt the same principle in every department of reform, and combine the elements of Eastern and Western thought, the civilization of ancient and modern times. Nowhere, indeed, in the world do we see such a singular juxtaposition of these different elements as we behold to-day in India. In their union lies the secret of our future greatness. In this country, reformation, in order to be true and abiding, must not only mean a new civilization, but also a revival. It must not be a mere introduction of Western customs, but a resuscitation into new life of the lingering vitality still to be found in the social organization of the Hindu community.

Whatever is true of other departments of improvement and reformation applies with peculiar force to the subject which is under consideration this evening. It would be really ungenerous and unfair to say that India has always been opposed to female improvement, simply because a few inhabitants on the banks of the Ganges protest against it to-day. Transport yourselves back in imagination hundreds of years ago, and you will find in the earlier writings and practices of this great nation emphatic protests against those injurious customs which we are now endeavouring to suppress; and positive injunctions and precepts in support of the reforms which are most needful. In the Vedantic period, in the Brihadaranyak Upanishad we come in contact with sacred and impressive dialogues on immortality between Maitreyi and her husband Yajnavalkya, in which these passages occur: Maitreyi said, "My lord, if this whole world full of wealth belonged to me, should I become immortal thereby?" "No," replied Yajnavalkya; "as is the life of fortunate people so shall thy life be. There is no hope of immortality by wealth." Maitreyi said—"What should I do with that which cannot make me immortal?" In a later period we find in the code of Manu high ethical precepts enjoining the necessity of female education, and of respect for the fair sex: "Where women are honoured, there the deities are pleased; but where they are dishonoured, all religious acts become fruitless." "In whatever family the husband is contented with his wife, and the wife with her husband, in that house will fortune be assuredly permanent." "By confinement at home, even under affectionate and observant guardians, they are not secure, but those women are truly secure who are guided by their own good inclinations." We have some excellent passages in Mahanirvan Tantra:—"Rear up a girl also in the same way and give her education with great care." "So long as a girl does not know how to honour and serve a husband, and is ignorant of moral discipline, her father should not give her away in marriage." Such passages as these clearly and authoritatively sanction the education of girls and their marriages at a proper age, and denounce the false logic which supports the custom of seclusion that has prevailed in Bengal and other parts of this country for some time past. But it is not merely precepts, but also examples, which we see in the early history of the Hindus. It is impossible to deny that women of exemplary character lived in this country, who adorned and purified Hindu homes, and exercised an ennobling influence far and wide. Their names are still cherished with respect and gratitude, and, I may say, in some cases with reverence, in many a Hindu family at the present day. In the early period of the Upanishads, Maitreyi, whom I have already mentioned, and Gargi, took prominent parts in religious and philosophical inquiries and discussions, and were devoted students of theology. In the two Hindu epics are represented such illustrious characters as Sita and Savitri, Draupadi and Damayanti, who shed lustre on Hindu mythology, and whose purity and devotion to their husbands Hindu ladies of the present day always reverentially emulate. The scientific acquirements of Khana and Lilavati have rendered their names famous in Indian history, and have always challenged admiration. The former was deeply acquainted with astronomy, and her "sayings" are familiar words in every Hindu household. Lilavati had a profound knowledge of mathematics. The work called after her name was written by her father, Bhaskar Acharya, for her benefit. At the present day many students of mathematics in this country find in that work much to edify them. In later times we find in Southern India the name of Avyar, a celebrated moral philosopher, who was also versed in geology and medicine, and whose moral treatises are still studied in Tamil schools in the Madras Presidency; Mira Bai, an extremely devout Hindu woman, whose religious books are read with great avidity and interest by the adherents of the Vaishnava sect; Hati Vidyalankar, who founded a school at Benares, and gave unmistakeable proofs of her knowledge of logic and metaphysics; and last of all, Ahalya Bai, whose administrative ability and philanthropy are well known. Many other such names might be brought forward. Those already adduced are, however, sufficient to bear irrefragable testimony to the progress of female education in ancient times. But alas! many of the good customs of the earlier Hindus have fallen into desuetude in the course of time. The people have greatly degenerated and deteriorated, and there are signs of intellectual and social degradation on all sides. The present condition of the country it is, indeed, sad to contemplate. Darkness covers the land. The intellect of the nation has been paralyzed, and its higher aspirations and impulses have decayed. We no longer see those pure, sweet, and happy Indian homes, where our ancestors enjoyed the pleasures of social and domestic life, and the higher pleasures of spiritual communion. The condition of Hindu women is miserable.

A revival took place exactly half a century ago, when some Christian Missionaries, fired with zeal in the cause of truth and female improvement, stood forward even at the risk of incurring odium and obloquy, and tried to diffuse the blessings of enlightenment among the native female population in Calcutta. Miss Cook, afterwards Mrs. Wilson, arrived in Calcutta in 1821, and in the course of a year established eight schools, containing 214 girls. She was indefatigable in her exertions, and thoroughly attached to the cause which she took up. These schools were subsequently amalgamated and incorporated into the "Central School." This school was established in the year 1826, and it is worthy of remark that an opulent native gentleman, Rajah Baidanath, came forward and gave a donation of Rs. 20,000, in order to help those who were engaged in the cause of female education in establishing a suitable building for the school. Miss Cook laboured under the auspices of the Church Missionary Society for a long time, and it must be confessed, and gratefully too, that her labours were crowned with a large measure of success. But I must be permitted to remark at the same time that the pupils belonging to her District Schools were mostly recruited from the lower classes—the indigent classes of native women in and around Calcutta. It was therefore reserved for the Hon. Mr. Bethune, in the year 1849, to erect a building and found an institution for the special benefit of the richer and the middle classes of native women. The school was opened with *éclat* in this city. Many native gentlemen came forward and assured the founder of their interest in the undertaking, and promised him support. But still, somehow or other, the school did not thrive. Several years elapsed before it gained anything like a sound and firm footing. Gradually the first excitement of popular antagonism subsided, and the native mind began to appreciate more and more the benefits of female enlightenment, and to realize its importance and necessity. And thus in course of time the cause of female education gradually and slowly yet steadily prospered. During the last decade, we have the most convincing facts and figures to prove that the success which has crowned the efforts of the State, and of philanthrophic Native and European gentlemen engaged in the cause, has far exceeded our most sanguine expectations. In the year 1860-61, there were only 16 girls' schools, with 395 pupils; but in the year 1869-70, the last official year, we find no less than 284 aided schools for girls, having 6,569 pupils. According to Mr. Howell's "Note on Education," it appears that there are throughout British India no less than 2,000 girls' schools, and upwards of 50,000 girls receiving education in such schools.

All. these facts indicate the sort of progress which is to be seen on the surface. That there are so many schools and so many girls receiving the benefits of liberal education, is indeed a matter for congratulation. But this is not all we have to say in order to prove the actual amount of progress that has been achieved. The under-currents of native feeling and thought, in the direction of progress and enlightenment, are indeed far more cheering and encouraging even than the external progress which we see on the surface, and which may be gathered from official reports. Go into an Indian zenana, and you will there find Hindu ladies who never came into contact with English governesses, reading Bengali books, and deriving much benefit with the aid of their husbands or brothers, and not only growing in intellectual knowledge, but also in faith and purity, and in general enlightenment. Is it not gratifying to see native ladies, though immured in the zenana, and beset with all the disadvantages of secluded life, casting away idolatry and all things unclean, along with ignorance and incorrect notions of men and things, and becoming wiser and better? Such scenes we behold, not in one or two exceptional families, but in many enlightened Hindu homes in Calcutta, and the large towns and stations in the mofussil. In fact, the light of knowledge has penetrated the strongholds of the zenana, and is enlightening those who would never come out to receive it. In the Central Bengal Division, under Mr. Woodrow, we find 1,327 native ladies receiving regular instruction in the zenana from what are called zenana teachers. All honour to such teachers! They are acting on a very important and liberal principle,—namely, if native ladies will not come to our schools, our schools must go to them: if they will not seek enlightenment in public schools, we must give them all those means and opportunities, and place those advantages and facilities at their disposal, which will enable them to receive the blessings of enlightenment in their own houses. Many a zenana teacher goes about visiting native families, and the results of the labours of such teachers are cheering and vastly encouraging. Several books that are on the table here, and also the brilliant specimens of needlework you see before you, show what an amount of progress has been made within the walls of the zenana of late years. Many of the Hindu ladies, who have made these things with their own hands, never received any training in a public school; nay, some of them never came under the influence of English governesses. For these reasons the books and works of art collected here are peculiarly creditable to those who made them. There is also an interesting monthly periodical called the *Bámábodhini Patrika*, which is published in Calcutta for the special and exclusive benefit of Hindu ladies, and is largely read by them both in Calcutta and in remote provincial stations. Hundreds of ladies are regular subscribers and readers of this journal, and if you open its pages you will find many valuable contributions from the pen of native ladies—charming verses, essays and dissertations upon moral and historical, and also scientific subjects. You will find too on the table books published by native ladies, some of them very highly creditable to the authors: 1—" Hindu Females"; 2—" Hindu Female Education," and 3—" Vishwa Shobha," by Kailas Basini Devi; 4—" Urvasi Natak," by a daughter of a Brahmin; 5—" Padya Kishore," by Bhubun Mohini Dasi; 6—" Kabita Mala," by a Lady of a respectable family; 7—" Nari Charit," by Martha Saudamini Sing; 8—" Manottama," by a Hindu Lady; 9—" Vidya Daridra Dalani"; 10—" Nilnolini Natak"; 11—" Chitta Bilashini," by Kristo Kamini Dasi.

These facts indisputably prove that female education has been making steady progress, not only outside the zenana in public schools, but also in the zenana. These are indeed hopeful signs, and cannot fail to make us sanguine as regards the future of our great country. I do not at all agree with the remarks made by the Director of Public Instruction in winding up his report on native female education. " Altogether," says he, " there is more that is disheartening than cheering in this branch of educational work." Every one who has had an insight into zenana life must admit that this is far from correct. There are facts which conclusively prove that the mind of the Hindu woman has been roused and awakened to a sense of its degraded condition, and that in many Hindu families earnest-minded, gentle, accomplished and devout ladies are earnestly trying to throw off those fetters of spiritual and social restrictions, imposed by a crafty priesthood, which kept them down for many generations. Many a Hindu girl is beginning to feel that she ought to take advantage of that light of civilization and education which is being freely enjoyed by native boys in public schools. Even the unfortunate Hindu widow feels that she has been grievously wronged, and that she must have access to such means as will enable her to grow in enlightenment and wisdom, and attain social happiness. Amongst adult native ladies, girls and widows, there is a wholesome excitement, which is beyond the shadow of a doubt.

It must, however, be confessed that there are yet serious obstacles in the way of female improvement, which we must successfully grapple with, and, if possible, overcome without any further delay. The work of female enlightenment and progress that we see around us is not so real, not so enduring, as it ought to be. The Hindu female mind is advancing indeed, but it advances only to a particular point, beyond which it cannot proceed. All our attempts and movements in this direction seem to have reached the boundary line, beyond which we cannot, under existing circumstances, take a single step, even if we would. This line must, sooner or later, be obliterated, before the work of native female education can be said to have made real progress. No permanent or abiding benefit can be expected, unless we lay the axe at the root of the tree of corruption and ignorance, and place the native woman in the wholesome atmosphere of moral and intellectual liberty and enlightenment. I have therefore thought it proper to come forward with a few suggestions of a practical character, which, if carried out, will, I believe, give the Hindu women that amount of real enlightenment and cûlture which they urgently require, and which will enable them to advance unfettered in the path of progress.

The first means to which I have to draw your attention is the establishment of NORMAL SCHOOLS. I am glad to inform you that two such schools have recently been established in the metropolis, one in connection with the Bethune Female School, and the other in connection with the Indian Reform Association. The latter institution at present contains thirteen adult ladies, who receive regular instruction in Bengali, English, and needlework, and, I believe, if they continue for a year or a year and a half only, they will be enabled to go out as tutoresses, and either take charge of girls' schools or give instructions to zenana ladies. There are two other such schools, one at Dacca and the other at Rampore, which, I am told, are not properly managed, but I hope they will improve in future. The importance of such schools is apparent and undeniable. We all feel the necessity of well-trained native female teachers, who would give instruction to zenana ladies, and also serve in the capacity of superintending mistresses in public schools, governmental and private. The dull and dry teachings of male tutors are not suited to the female mind, and are not at all calculated to impart that special training which it needs. It is female teachers alone who can properly develope, exalt, and purify the female mind and reform female life. The necessity of such teachers, therefore, is manifest to every one who has thought over the subject at all, and has had some practical experience in the matter. I cannot leave this part of the subject without mentioning, with cordial thanks, the name of Miss Carpenter, who, while here, gave a great impetus to the cause of female education, and opened the eyes, both of the educational authorities of this country and the Government, to the importance of Female Normal Schools. It was on her recommendation that the Government sanctioned an annual outlay of public money for the purpose of establishing and sustaining Native Female Normal Schools in the presidency towns in India.

Secondly, an Inspectress is very much needed, who might go and visit Hindu families, and see how the zenana teachers are doing their work. She should also inspect Government public schools for girls, and send periodical reports to Government as to how these schools are being managed. Such an Inspectress would do an immense amount of good, which cannot possibly be achieved otherwise in the present circumstances of the country. At present the Government cannot possibly take any notice of what is being done in the zenana, and no improvement is possible, simply because there is none to go there and report matters to Government and the public. If we have well-trained and efficient Inspectors who look after the Government and aided schools, we must likewise have well-trained and competent Inspectresses who would keep girls' schools, and especially the zenana agency, in a state of efficiency.

In the third place we require Adult Classes. So long as the pernicious custom of premature marriage exists in this country, Hindu girls must leave public schools before they have received anything like a sound education. They begin their education at the age of seven, and give up their studies probably at the age of nine or ten; and then when they have gone back to their own homes they find themselves surrounded by an atmosphere of ignorance, folly, and superstition, which paralyzes their energies, arrests the growth of their intellects, and prevents their prosecuting their studies further. Thus, native girls renounce their studies at a very early age, when in fact, in civilized countries, they are found to begin them. The only way to meet the difficulty of the case is to open adult female classes in central and convenient localities in large towns. We must take circumstances as they are. It will not do to say native girls must continue for five or six years more in public schools, if they wish to receive the benefits of enlightenment. We cannot be inexorable dictators in a matter like this. In the present state of Hindu society, native girls must submit to the injunctions and directions of their parents and guardians, and, in conformity with the customs of the country, get married at a premature age, and shortly after sever their connection with public schools. If this is inevitable, and it must be so for some time to come, some means should be devised to meet the difficulties of the case. If the girls must enter the zenana, and make up their minds not to come out again, we must send teachers to them and give them the means of continuing their studies. Let the girls of five or six neighbouring families be collected together day after day in the house of a respectable native, and let a competent female teacher be appointed to give them systematic instruction. Thus we may have twenty or thirty small adult classes in different parts of Calcutta, where ladies of advanced age will be enabled to prosecute their studies freely, after leaving school, for any length of time they like.

Fourthly, we want secular teachers for the zenana. I have already given zenana teachers the credit which is due to them. I have given them the sincere and fervent thanks of my heart for what they have so nobly done and are doing. But at the same time we must not be blind to the fact that they are giving education with a view to make their pupils converts to Christianity. Certainly they are bound to do so, according to the light which is in them, and we should be ungrateful indeed if we went to the extent of interfering with their freedom of action, or throwing obstacles in their way. Let them have their course by all means; but at the same time we must call upon the Government to show their regard for that principle of religious neutrality which they are bound to carry out in all circumstances, not only for the education of males, but also for the education of women. It seems strange that in the present state of female education in India, there are no means or appliances whatever for giving secular instruction to the zenana ladies, under the auspices of the Government. The Government ought to employ competent and efficient European female teachers who would go about visiting Hindu families, and give secular instruction in literature and the sciences, just as has been done for many years—systematically and on principle—in Government Schools and Colleges for boys. If our boys receive secular education, why should not our girls receive it too? Is it not unfair that the Government should deny the zenana ladies secular enlightenment, while it is freely accorded to boys? I do not mean to say that the Government should spread godless education far and wide, but I do believe that moral and secular instruction, if imparted in a truthful and devout spirit, will tend not only to purify the minds of native boys and girls, but also to reform the Indian household and adorn it with all those charms and embellishments of a moral and spiritual character which are at present most needed. I do believe the result of Government education has been the awakening of the native intellect to such an extent, as to draw it away from idolatry and superstition, and lead it into the path of liberal reform; and may we not expect the same favourable results in the sphere of female education? I think the educational authorities in India ought to take this matter into consideration. In fact, I cannot account for this anomaly, except on the supposition that the matter was never fairly represented to the Government. Now that the matter has been brought to public notice, I hope and trust that this great evil will be remedied, and this great want will be supplied without any further delay. It is to be hoped that a body of competent female teachers English and native will be trained up, who will give liberal education, in the strictest sense of the term—unsectarian, liberal, secular education—to Indian girls.

Fifthly, I propose visits to interesting places. What is being done at the present moment in England for the benefit of the working classes, ought to be done in India for the benefit of Indian women. Those who attend the Working Men's Institutes in England are now and then placed under the charge of competent and experienced scientific men, under whose guidance they go and visit public museums, libraries, and other interesting public places, and with whose aid they are enabled to learn many important scientific and historical facts. A similar experiment may be tried with great advantage in our country. Competent and experienced English ladies may occasionally invite together five-and-twenty native ladies and proceed with them to such places as the Asiatic Museum and the Botanical Gardens, and explain to them the varied and interesting objects that are to be found there, for the benefit of their minds and hearts, with illustrations. Such practical lessons will do them immense good, which no mere amount of book knowledge will ever be able to achieve. At present, immured in the zenana, they can have very little idea of what transpires outside the house; but if thus now and then they are introduced into such places as I have mentioned, they will be able to see with their own eyes the repositories of wisdom in the departments of art and science which have been handed down from generation to generation; and in the amplitudes of nature, they will survey flowers and vegetables, rocks and rivers, and whatever is beautiful and sublime in creation, which will expand their minds, destroy their prejudices, and make knowledge interesting to them. Lastly, I should suggest periodical examinations and distribution of prizes to accomplished and intelligent native girls, at stated times, under the auspices of the Social Science Association. This will no doubt afford great encouragement to Hindu ladies. They will be greatly encouraged if they learn that we are sincerely anxious about their welfare, and that we are ready to assist them with books and scientific instruments and apparatus as a reward for merit. There are many girls and ladies of advanced age in Calcutta who, under the auspices of the Bamabodhini Society, now receive handsome prizes for proficiency. I think Government and such influential public bodies as the Social Science Association ought to co-operate in a manner like this, and encourage merit with suitable rewards.

Ladies and Gentlemen, I have placed before you six simple and practical suggestions, which I hope and trust will be carried out without any difficulty. I honestly believe that they are not impracticable or Utopian. Nor do they require a large outlay of money to carry them into effect. If we sincerely feel the necessity of female improvement, I think it is quite possible, if we sit together, to devise proper means and take prompt steps to give effect to these proposals. If we cannot do anything in the matter, let us go to those who can help us with money or otherwise. Let us make proper and respectful representations to Government, if needful. With private liberality and aid, and with the countenance and support of such a society as the Social Science Association, and, above all, with earnest and vigorous personal action, much I believe may be done, and much I hope will be done in due time.

A few words to my countrymen. Very little indeed can be said on a stock subject like this. You have heard hundreds of discourses and lectures on female education. You all admit its necessity and its paramount importance. You entertain no doubt about that. It would be doing injustice to you, it would be a scandal to your intellect, to suppose that any appeal is needed at this moment to your feelings or your understanding in order to move and quicken you with a right motive to action in this matter. You all feel, in your every-day life, the necessity of giving proper training and education to the intellectual powers and moral sentiments of those who are near and dear to you. You cannot with impunity keep down your ladies in a state of mental, social, and moral subjection. Any attempt to do so will recoil upon you with a terrible rebound. It is a matter in which our interests are indentified with those of our wives, and sisters, and daughters. If we do them injustice and deny them their rights and privileges, such a course of conduct will inevitably and assuredly jeopardize our own best interests. It is not merely a question of charity and fairness, that we should educate our ladies. Even if we were to view it from a lower stand-point, that of mere self-love, we would find that it is our interest at the present moment, and not merely our incumbent duty, to educate and reform our wives and daughters. What John Stuart Mill has said with reference to female society in England, applies with peculiar force to our country. "The time has come," he says, "when if women are not raised to the intellectual level of men, men must be pulled down to the mental level of women." Or, to use the well-known words of the Poet Laureate—

"Woman's cause is man's; they rise or sink
Together, dwarfed or godlike, bond or free."

Do you not feel in your daily life that your wives and mothers are great impediments, sometimes insuperable obstacles, in the way of your own intellectual and moral improvement? How many of you are anxious to go to England at this moment! But you cannot do so, because there are caste difficulties in the way, and the ladies of your household insist upon your strictly observing the rules of caste. There are many of you who would cut asunder at this very moment all those ties and fetters which bind you to Hindu idolatry and superstition. But you dare not take a step in advance, simply because your ladies are in your way. Give them education, and they will prove helping-hands. They will not only learn what is right, they will not only accept right convictions in their own hearts, but they will also render you valuable practical aid, and prove your companions in the higher enterprises of life. At present there are educated fathers and uneducated mothers, enlightened husbands and illiterate wives. There are conscientious and pure-minded and earnest-hearted fathers, but their daughters are being trained up by their superstitious mothers in the midst of falsehood and impurity. Try to remove such anomalies, and by educating your mothers, wives, sisters, and daughters, bring them up to your level. As you are marching forward and endeavouring to place yourselves in the front rank of civilization, take your female relatives with you; then the amelioration of the country will be complete. At present only half of the population of India is receiving culture and enlightenment. But the effects of such reformation among the male section of the community are to a great extent neutralized by the want of education among the women. By educating women we would reinforce our own energies, and with mutual co-operation elevate and reform our country. I do not exhort you to adopt rash and premature steps in furthering the work of female improvement. Do not force upon your ladies anything like false refinement. Do not endeavour to bolster up a meretricious refinement upon the unstable basis of outlandish customs. Try to establish the roots of reform deep in the soil of India. As in religious, so in social reformation, try to make the work of advancement gradual and steady, but on the whole, national and enduring. Anything that you do from no higher motive than the imitation of foreign nations, must sooner or later die away; but if you call forth the latent resources of the native mind, you will promote true and solid national civilization. It has been my good fortune to study the secret of English domestic purity and social happiness in England, and my observations and experiences have fully convinced me that England is what she is on account of the superiority of her ladies. I had the pleasure to associate with accomplished and devout ladies in many cities and towns in England; and indeed I naturally felt inclined to transfer to my country those exemplary traits of female character which I saw with my own eyes in that distant country. But how can that be done? Not if you merely imitate the exterior of English life; not if you try to adopt the superficial refinement of outward customs and manners, nor if you convulse native society into spasmodic movements with fitful outbursts of youthful zeal. It is your duty to enter into the spirit of true English refinement, and judge for yourselves whether England's greatness consists in observing the outward laws of social life, or in conforming to that system of moral and spritual discipline under which every heart ought to be placed. Introduce that system of domestic discipline into your country, improve the minds of your women and quicken their souls with true moral and religious impulses; and bring them under the salutary restraints of moral discipline. Convince them that true emancipation means deliverance from the fetters of corruption and untruth ; and that true liberty means the power to act freely according to the light of God in the soul, and to discharge our duties to ourselves, to others, and to our God without any hindrance. These are the great things which your women require at the present moment, and if you teach them moral and intellectual discipline,—if you make them understand the value of truth, and science, and religion,—you will establish that social equality and purity without which Indian reformation would be merely superficial refinement. If you wish to give India true civilization, infuse purity and instil right ideas of duty into the native female mind.

DISCUSSION.

The Lord Bishop of Calcutta said—Mr. President, Ladies, and Gentlemen,—I have great pleasure in proposing, as you have requested me, a vote of thanks to my friend Babu Keshub Chunder Sen, for the address which he has made to you on the interesting subject which he has chosen. I need scarcely say that the very wise choice of this subject was an additional reason for thankfulness to him. Everything that can bring before you the necessity of the education of the female portion of the community of India, from first to last, is of necessity clear to every one who has the true interests of the country at heart. I have listened with great interest to his words, and I hope and trust that what I can agree with him in it will be taken home by all parents and husbands here present. I cannot, as I have said, agree with him in every particular. I cannot imagine that the steps which he suggests are altogether such as will carry out his ends. A part, indeed, of these steps has already been taken by the Government. He appeals to the Government of India. Government does not object to the education of females, without any religious bias of any kind. The schools which the Government provide are open, and in them the teaching of religion is forbidden. Therefore the girls in that point have the same opportunity that boys have. Government also is most anxious to establish such normal schools as the lecturer suggests. The difficulty is to find the materials. He appeals again to the Government, to bring ladies out from England, who should be competent to train other school-mistresses in their work, to inspect the work of these teachers, to go further, to go into the zenana, and to see there how education is progressing. But there is to be one condition. They are not to teach religion; here is the difficulty no doubt. He mentioned several illustrious names in your history.

You will find that not one of these was an irreligious person. They were wrapt up in their religion. The history of India will show that these ladies were all of the most religious character, distinctly and earnestly religious, according to the knowledge they possessed. It is most remarkable in their history that you will find this most prominent feature in their lives, and it was from that that their education and governing power seemed to flow. Then, again, he desired that ladies, such as he had seen in England, should come out to India, to your homes out here. He saw these homes in England; he appreciated them; he justly said that what made these homes what they were was the present enlightenment of these ladies. But what made these homes be what they are, and these ladies be what they are; it is Christianity. This is what made these ladies to be what they are, and these homes to be what they are. Without this you will not get these ladies to be what they are. I would not enforce religion. God forbid. I would trust it to the free consciences of those who can speak and hear. That is true liberty and that is true equality; and, therefore, while I sympathise with him deeply in the object he proposes to accomplish, and while I admire the energy and ability with which he would effect the amelioration of the country, I pray God that full light may come upon him, and that this instrument may prove indeed His own for achieving these good objects. But I do not believe that, without this grace of God, he will ever accomplish all he proposes. I am afraid that I am rather trespassing beyond measure in proposing a vote of thanks, but it is because I feel most deeply upon this subject, because I hope to see him a chosen instrument for God's ends, that I hope the full light of truth, and the full possession of all those graces which God has to give, that I desire to see a further advancement of this measure. He has spoken of the good of education; he has spoken of the blessings it will be to your homes which knowledge and the cultivation of the intellect will bestow. He has described them such as I hope you will have when you come out with your ladies to scientific visits with your children around you. If five or six hundred gentlemen, in Calcutta or its neighbourhood, will join together, and take their wives and children out to some of these places; if they will, if they choose, ask a few of us to join them, in such pleasing sorts of entertainment, they will make a better beginning, and much more so than I can see in the suggestions now laid before you. Now will eight or nine hundred native gentlemen in Calcutta, go out anywhere with their wives and children, to the Botanical Gardens, or to the Asiatic Society's Museum? Why will they not? We do it continually. It is only a little want of courage. I am afraid it is a little want of moral courage. Now do let me ask you to form such a party as you suggest. It will be of the greatest possible benefit. And then, just consider, if education of this character is desirable, about 50 years may be spent in some enlightenment, good real work, a knowledge of books, and other advantages, such as playing on the piano, dancing, and other accomplishments. But surely we ought not to limit our wives to this world. In all education we must have regard to the world to come. It is when we understand the meaning and objects of this life that it is merely a school in which we are all to be disciplined and trained for the world to come, that we can realize its grandeur, and devote ourselves to its work properly. Then you will see that there must be religious education. The lecturer desires the teachers to be devoted to their work. He desired that they should be devout people. I also wish that they should be devout, both teachers and pupils. But then there must be some definite object in view, some instruction from on High, some revelation from God. Then we shall know what we are doing, then I believe, with that object, that lady teachers will no longer be lacking either in England or in India. This is what is required. But this is looking far off. If this can be understood and thoroughly taken in hand, I believe they will have that enlightenment in their homes. It was that spiritual hope obtaining in homes which makes homes what they are in England. It is that which makes them to be places where husbands and parents resort with joy and gladness, sure that they shall find those who can enter into their inmost sympathies. This is what makes me so anxious to see this female education gain and increase thoroughout the length and breadth of the land. I trust it may increase till your homes are built up as they should be, and till that full light which comes from on High penetrates every household in India.

In conclusion, I again ask you to join me in proposing a vote of thanks to Babu Keshub Chunder Sen, for the able and valuable address with which he has favoured us to-day.

Dr. Norman Chevers said—Mr. President, Ladies, and Gentlemen,—I have very great pleasure in seconding the motion now before you. I think that all who have heard this address of the eminent Indian reformer will feel, whatever their opinions may be, that it has been characterised, not so much for its beaming and singular eloquence as for its very remarkable practical character, and also, according to his opinions, for its very great liberality in the exposition of his opinions. I will not attempt to follow the line of argument adopted by the Lord Bishop, although I feel very sure that some of those present will agree with what he said, not because I do not feel with him, but because I think that the path which he has taken is one too sacred for me to follow. I will merely say a few words with regard to the example England has set in this question of advancing the education of women. Any one who has studied the history of English morality, and especially the social history of England, must be well aware that, in reality during the last century, excepting in the universities amongst the sons of the nobility and the sons of a few who had almost through their riches raised themselves to the position of the aristocracy, there was very little common education indeed amongst men. Look at the women; what was to be found amongst them at that time was a singular amount of superficial refinement and of piety, and a great many of the best qualities which adorn the sex, and a want of education which was as general as it was lamentable. Look at the history of literature. Recollect how very few female writers of any eminence there were during the last century. Look at the writings of to-day. I will not say that they are all such as one would wish to see in so advanced an age as the nineteenth century. Still there was one most distinguishing characteristic in the writings of women in the present day. Look at the writings of such writers as these—Mrs. Oliphant, Grey, Austen, the author of "John Halifax, Gentlemen" and other writers such as these. Look at the marvellous purity of the English style in this circle of authors. The English was exceedingly beautiful. Lord Macaulay himself did not write in a better style than any one of these ladies that I have mentioned. And although I cannot join with those who advocate the necessity of professions for women at the present day—the right of women to become statesmen and rulers in the land—although I cannot join with those who see fit to go forward in competition with women in every respect, there cannot certainly be a doubt that the great tendency which now exists in Europe and America to elevate the position of women, arises from the general levelling up in the social education of women Therefore, I would say that we in England and in Europe generally, are only very little in advance of you in India. Those reforms which have been so zealously advanced by the social reformer who has addressed you, are now making progress in India just commensurate with the progress previously made in England, and I would not look so much to the result of the education of the present day. You are now in this present day, only educating your girls. You must recollect that you yourselves are only commencing. When I came to this country twenty-three years ago, there was scarcely any education whatever among girls or women, or if there was any, it was only experimental. And with regard to the proposal that the native gentlemen of Calcutta should take their wives to places of interest, such as the Botanical Gardens and the rooms of the Asiatic Society, I would scarcely expect that from the gentlemen of Calcutta at the present time, because I know that though people wish to see the proposal carried out, the ladies positively would not go. Our motto must be in this case to go slowly, to make gradual, sufficient, and steady progress. "Let the light of education enter somewhat gradually but surely—and slowly if you will—into the minds of the women of India." And I do believe that should it be in our power to know, as I trust it may, fifty years hence, it is very probable that, at that time, when the women of Bengal shall be descendants of educated grandmothers, there can be scarcely any doubt whatever that they will occupy a position such as we wish them to have, having clear and open minds ready to receive knowledge, by no means inferior to that of their husbands, and that they will then occupy a position which will enable them to compare, without any detriment, with the most enlightened women of European countries.

The Rev. **Kristo Mohun Banerjee** said:—Mr. President, Ladies and Gentlemen,—I rise to say a few words in support of the resolution now before the meeting. The Lord Bishop of Calcutta has done justice to one point, and on that, like the gentleman who seconded the resolution, it is not my intention to dwell. But I wish to meet the subject on which my learned friend has given such a well-considered and interesting lecture from our Indian point of view. My friend, in his lecture, reminded us that the civilization of India is not to be as it were created, anew, but to be restored and revived. To a certain extent I cordially agree with all that he has said. Now, Mr. President, ladies, and gentlemen, if we were to survey the mental state of the women of Bengal at the present day, and if we were to compare that state with the intellectual state of the women of India in general two thousand years ago,—if we were to compare these two mental states, I am not at all certain that the women of our age need be much ashamed of their present condition, or that they will be found to be vastly inferior to their predecessors in the age of Kalidassa. In the fragmentary works of Kalidassa we find men and women speaking in the common vernacular language, and Brahmins and Rajahs speaking in the Sanskrit language. Now, gentlemen, I look upon that as a very forcible index of the mental state of society in that age. It meant that education and learning were not generally known even among the male population, that there were learned Brahmins, that there were learned Rajahs, but that the lower classes did not know anything of the learned languages, because they spoke in the vernacular only. Now, gentlemen, although there were a few names, honorable names, of women, we all know of instances of successful cultivation of learning and science; still I doubt very much, that in the days of Kalidassa there could be found a much larger number of females, of lettered native females, than in our own age. In our age, too, we have a good many, as my friend has shown, who have learnt to read and write, though they are immured in the zenana; and as evidence of that my learned friend here has produced such proofs as cannot be gainsaid,—you have only to look at the books, and at the pictures here exhibited. Now that being the case, in what respect is it that our society requires to be revised? I think in this respect—that in the days of Kalidassa, few as the learned women were, they were not fewer than the learned men; that, generally speaking, husbands and wives were pretty much in the same level in an intellectual point of view. Such is not the case now. We see there is a great inequality of level between husband and wife. We see the husband very industriously pursuing the study of literature and science to the utmost extent, vying with the children of England as within the last few years we saw one of our countrymen, not only vying, but standing third in the list of 300 Anglo-Saxon young men, who competed with him for the Civil Service. We have had our countrymen in England surprising European audiences by the exhibition of their learning, their eloquence, and their intellectual greatness. Gentlemen, where were their wives? On what level were their wives, uneducated ladies, in comparison with their husbands, educated gentlemen? There then is the peculiarity of our age—the peculiarity is this that there are very few educated ladies in comparison with our educated gentlemen (The Bishop:—You agree with the Viceroy: you are in favour of levelling up). See the vast difference between you and your wives. It is this, gentlemen, which I say it is your duty to rectify.

My friend made some very excellent suggestions about taking your ladies out to see something of the air of heaven, of the works of nature in the Botanical Gardens, and in the Asiatic Society's Museum. I will, gentlemen, presume to say something still higher and still further. I did not understand my friend when he cautioned you too much against outlandish innovations. I do not know whether travelling by railway is to be looked upon as an outlandish innovation, whether making use of the Electric Telegraph is to be considered as such. I do not know whether in his meaning that would be an outlandish civilization. But this I do mean that while you are so freely enjoying the railway, while you are so freely making use of the railway, to see different parts of the country, I ask, have not your ladies the same right to enjoy the same advantages? Did the God of heaven create the elements so as to produce that vast force which steam possesses, only for the comforts and convenience of men? Here, gentlemen, I ask you, I put it to your own consciences, if you think that women are entitled to enjoy their liberty as the daughters of God, as you are entitled to enjoy your liberty as the sons of God. I say, if you look on them as upon yourselves as the common children of God, I ask you to consider, and commune in your own minds, whether they are not as much entitled to enjoy those gifts of providence and nature which you are enjoying, whether they have not the same right to breathe the free air of the outside world, outside their houses, outside the zenana, as you have; and if so, I not only second the proposal of my friend the learned lecturer, that you should now and then, in sixes and sevens, bring your wives, stealthily, to the Botanical Gardens, as I at one time did and was also taken up. But I must also mention, that when I did so, and was by mistake taken up by a chowkedar those days have gone by. We now, fortunately, live in better times and in happier days, and I believe that none of you are likely to pass through that difficulty. Well I say, then—in supporting the proposal of the learned lecturer—that you ought not only to take your wives and daughters, stealthily, now and then to the Botanical Gardens and to the Asiatic Society's Museum, but I say that you ought to let them have to the utmost of your power, the same enjoyments to the gifts of God and of the gifts of nature, the same advantages which you also enjoy daily, from the discoveries of science, from railways, and also from steam vessels, though you have not yet, I believe, come to make much use of the latter. But this is what I would impress upon you, my friends—that the great difference between the intellectual state of women in our days, and the intellectual state of women in the days of Kalidassa, lies in this, that now they have very highly cultivated husbands and fathers, and yet they themselves occupy a very lowly position. I beseech you, my dear brethren, to consider to what extent you may be able to bridge over this difference, and be able to make use of railways and other outlandish innovations. I beseech you, my dear friends, to consider to what extent you may, under Providence, be able to overcome these outlandish innovations, not only on account of yourselves, but of your wives and your daughters. For, depend upon it, the national elevation of the people of India is absolutely dependent upon the moral, social, and intellectual progress of the women, as well as of that of the men, comprising together the computed 150,000,000 of souls in British India.

2.—*On Physical Education. By Captain* R. G. LOCH.

[Read on the 22nd April 1871.]

THE object of all education is to attract, utilize, and bring to perfection the powers and capabilities of men. When the education of the mind is the immediate object, the highest branch of the science is attempted. The attributes of a man's mind are so subtle and superior that the education of the mere physical energies of man sinks into insignificance. And it is this consciousness which gives rise to a great danger,—namely, the danger of the neglect of physical education *because* it is inferior. This is a snare of a peculiarly complex character, for neglect in this quarter, independently of its visible and immediate effects as evidenced in stunted growth, contracted conformation, and imperfect development, produces diseases and maladies which unfit man for the struggle of life, and react upon his higher organization to such an extent that he finally becomes unable to avail himself of those higher faculties for the advantage of which he had sacrificed due attention to his physical welfare. By the cultivation of the intellect carried on at the expense of the wants of the body the constitution suddenly gives way, and the result is that neither are able to recover themselves. Every one is familiar with numerous instances where change, air, and exercise have been prescribed as the only remedy for overworked and broken down business men and scientific enthusiasts. Sometimes the remedy is effectual; very often it is unavailing, not, however, because there is no virtue in the prescription, but because it has not been applied in season.

It is this intimate connection between mental and physical education which makes the latter so especially important. If man could ignore the necessities of the body, and devote himself entirely to his intellectual cravings, without shortening his life, or exposing himself to protracted ill health, it would be difficult to put forward such a strong pretension on behalf of physical education, but it is not possible, and we must therefore cherish the body that the mind may remain vigorous.

Taking the crude meaning of the term, physical education is merely the process of the full development of the bodily powers. But this is really only a partial interpretation, the lifeless body of the word in which the 'vis viva' is absent, for in the consideration of this subject the highest point to be gained, the great endeavour which we try to keep in view, is the production of the highest physical development which is *consistent* with the fullest intellectual excellence.

The idea of attaining this is, perhaps, somewhat utopian, but still we must be ready to avow and proclaim this as our object. That the result is often so meagre is simply an evidence of human infirmity.

Now, taking it for granted that the training of the bodily forces has always this object, we are able to drop allusion to it and to consider the subject from its narrower point of view, that is, the best means of producing phyiscal excellence, as considered *per se.* Now the perfection of physical excellence combines the preservation of what is called the constitution—that is, the tenacity of the vital energies—with the creation and maintenance of muscular force. This point is deserving of particular attention because it is one so often and so naturally overlooked,—I say, naturally, because muscular development is in no way a guarantee for the presence of a good constitution, and delicacy of constitution is very often found in combination with splendid muscular conformation; *but* it is hard for one not to believe the evidence of the eye,—to think that within a nobly symmetrical frame there lurks a frailty and delicacy of organization which if overlooked, or even underrated, will sow the seeds of a rapid decline.

It is therefore of primary importance to discover what the constitution is, and if it be found delicate or unstable, the promotion of bodily energy can be proceeded with only with the greatest caution. Constant observation is required for this purpose,—observation which should begin with childhood, and which should be specially on the alert when the age of puberty is being entered upon, for it is then that we pass through the critical periods of life. It is at those seasons that a system of change is in operation, and it often depends on the method of treatment then enforced, and the habits of life then encouraged, what the future shall be. It is then that the constitution is most sensible to impression, and parents are as often astonished by pale sickly children throwing off their ailments, and becoming healthy and strong, as by sturdy bright looking children languishing and sickening.

The physical education of man begins with his infancy, and is comprehended in the words diet, recreation, exercise.

Diet plays a leading part in all branches of physical education, and when it takes the form called 'training,' attention to it is as strictly insisted on, as it is by a physician in illness and convalescence. Diet must always vary according to conditions of climate, and occupations of life. It is a question which can never be viewed absolutely. It must always be considered in relation with the tastes of the individual and the ordinary purposes for which each individual is intended. It is the fashion in certain parts of Central Africa to admire fat women. It has been found that this charming obesity can be most readily attained by unlimited draughts of milk. Milk is therefore in many instances the sole food of Ethiopian 'belles,' who are desirous of imitating the prevailing fashion. It must be supposed that considerable importance is attached to this form of beauty, and therefore we are ready to receive it as a justification of what appears to us a very horrid habit. The taste of Europeans, and of the English especially, for flesh food is viewed by eastern nations with the reverse of favor, while it is to the substantial food that we are apt to attribute the muscular frame of which Englishmen are so fond of boasting. Asiatic nations make meat but a small, if any, portion of their meals, and it is to this we are wont to assign, wrongly I think, their slighter *physique*, which I myself should be disposed to lay to the door of differences of race, climate, and conditions of life.

Recreation and exercise have so much in common that it becomes convenient to treat of them together. It is obvious that it should be the object of the parent or teacher to make exercise at one and the same time a pleasant and a healthful occupation. If exercise of a particular nature goes 'against the grain' of certain people, it is manifest it is not suitable for them. Care should, however, be taken to distinguish between the disinclination which comes of unsuitability, and that which is the result of laziness. Indeed, if laziness be detected, it is almost always safe to raise the quantity of exercise demanded; for it is found that, as a general rule, sluggish natures are capable of enduring and thriving on more trying work than impetuous or excitable men. There seems to be something in an excitable temperament which refuses to shake off the efforts of exertion, and although such natures are capable of undergoing great fatigue under excitement, a reaction is inevitable.

All exercise at its commencement should be gradual. The effort to teach a child to run before it can walk must end in failure; a day's hard work when the body is soft from want of exercise very often causes some serious injury, of which there would have been no danger had the muscles been gradually prepared. Then again, it requires immense discernment and unflagging attention to distinguish between those who are fitted for daily exertion, and those who require intervals of rest, sometimes every other, sometimes every third or fourth day. In the severer courses of training many a promising debutant breaks down under the unceasing grind to which a careless 'coach' subjects him. It is impossible to lay down rules on this point, observation must take their place. As long as freshness of spirit and elasticity of temperament are unchecked, it can be safely asserted that no over-exertion has been exacted, but the moment despondency show signs of appearing, the remedy must be found in rest, sometimes partial, sometimes complete.

Man is a hardy animal. He will undergo more training than other animals without ill effects. He can remain longer in the highest pitch of training, but it must always be remembered that with him, as with others, the time of what is technically called perfect condition is a very critical one. It is said that when a man reaches that point he has reached limits beyond which if he were to press one iota he would injure his constitution irreparably,—a man breaking down from overstrain in this manner generally breaks down completely. The splendid apparent health, and development of form which has been produced by his training very often covers ravages which have been going on upon the vital organs of his body from over-exertion. The heart in particular is very open to such attacks, but will perform its functions without showing any sign until long after the seeds of decay have been implanted. It is only when its presence manifests itself by sudden languor, unexpected faintness, palpitation, and such like, that the trainer becomes aware on what precarious tenure his pupil is holding on to life, and by that time the constitution is usually ruined, and the man, if he lives, is a mere shadow of himself, a valetudinarian, a field for the experiments of tentative medical science.

But with care this may be avoided. It is in childhood and youth that symptoms of indisposition and incompatibility with certain exercises most readily manifest themselves, and careful observation then will generally indicate to what extent it is safe to press the active pursuits of the child. It is of much importance too at this early stage not to allow any particular exercise or pursuit to possess a predominating influence. It is wiser to encourage a variety of tastes, the very acquirement of which will educate the faculties for comprehending and adapting themselves to novel experiences as they come before a man during his life; whereas if a boy be habituated to one class of exercises, and one only, he will find himself very awkward and slow at other accomplishments, which, had his training been more liberal, he could have mastered with ease. On the other hand, if it be the object to procure a high standard of excellence in one, or a few peculiar pursuits, no time should be lost in restricting the pupil to these branches of education as much as possible. In manly exercises and accomplishments it is notable that men very seldom develope any very peculiar proficiency after attaining to manhood. The best riders have usually begun on a pony when they were little more than the height of the table, the best athletes, the fastest runners, are generally those who have trained themselves in those pursuits from a very early age.

The view to take of it seems to be this. If you would educate for a profession, let all which will be of advantage to that profession have precedence over other pursuits, but if nothing more than accomplishment be the proposed end, it seems wiser to enlarge their number, than to pay undivided attention to one at the expense of others. When the boy grows older he will naturally make the selection to which his innate likings tend, and he will easily gain sufficient proficiency at that, and at the same time will have acquired that general facility for adapting himself to novel conditions and circumstances which is necessarily so beneficial to every one.

So far attention has only been turned to the general education of physical power; let us now turn to those forms of it which educate for some special branch.

The pursuits of men are so numerous, so varying, and so opposed, that even the most versatile man can hope to acquire excellence in only a limited number. Sometimes two pursuits are so utterly opposed to each other in their first principles that the same man could not possibly shine in both. For instance, size, which is a qualification in one is an absolute obstacle to success in another, Weight interferes with a third. Fat debars a man from a fourth, and so on. Thus a man very soon finds out those pursuits which are most suitable to his habits and conformation.

As a general rule, strength, speed, and quickness of hand and eye will qualify a man for most things, and the developments of these form a large part of the course of training. Get rid of all fatty matter, harden all the soft flesh, increase all the muscles, accustom the lungs to the rapid breathing which is required in all sustained or powerful efforts, and the result is a man in good condition. He will be able to undergo very great exertion without fatigue, and even when he becomes exhausted, a short rest will restore his energies, as long as no organic disease has been fostered during the long course of training which has done so much for his outward appearance.

The astonishing elasticity of a man in perfect condition is one of the most notable points connected with training. It is not uncommon to see a man after a severe race so utterly distressed that one begins to have serious apprehensions about him. His eyes are staring and bloodshot,—his face crimson, or deathly pale,—his breathing a convulsive sob,—his limbs powerless and rigid,—he cannot speak, and his greatest relief seems to be to lie restlessly at full length on the ground. When this supreme exhaustion passes away, he is able to think about relieving the extreme dryness of his mouth and throat. The slightest draught, even if it be only water, though in general a stronger liquid is not considered objectionable, works a magic effect, and in the course of a few minutes all the signs of supreme exertion have vanished, and the man is prepared to enter into a second contest nearly as vigorous as ever. On the other hand, had a man only half trained gone through the same exertion, and arrived at the goal in the same state of exhaustion, he would have been unable to rally from its effects in the same way, and would have laid himself open to the danger of some permanent injury. The course of training is a hard road to travel, but if a man would excel in any of the exercises which tax a man's powers to the full, the only way in which he can do so with safety to himself is by a gradual preparation, during which the utmost attention must be paid to the peculiarities of his constitution and habits. It is marvellous what an improvement is manifested where either inclination or necessity directs a man's energies into a certain channel. Darwin's theory of rudimentary organs, and the development of new faculties according to altered conditions of life, is strikingly exemplified in a restricted sense. From disuse, and the preference which is given by custom to the other hand, the left arm is comparatively an awkward inefficient member, on the downhill road towards becoming a rudimentary organ. We see nothing of the same sort in the left leg; it is called upon to exercise the same functions as its fellow, and in an equal degree, and the result is that there is no inferiority. On the other hand, habit perfects certain gifts in a surprising manner. The Red Indian, for example, being essentially a wanderer, having to rely from his infancy on his pedestrian powers, whether for journeying in the pursuit of game, or in warfare, has acquired a length of stride which European pedestrians have failed to equal, and they are endowed with powers of endurance which I take to have become a national characteristic, solely as the result of an enforced mode of life. India is not wanting in an instance of the same kind. The astonishing feats performed by 'palkee' bearers extort from a foreigner unfeigned surprise. These men, by no means powerful or athletic in build, endowed with no special qualifications visible to the eye, can travel over forty and fifty miles in a day, taking their turn in carrying a loaded palkee, and at such a speed as would tax the powers of many a professed pedestrian. The Indian bheestie is another case in point. No amateur, be he European or Asiatic, who has committed himself to carrying a full waterskin, even for a short distance, but will admit that its transport is a work of no common difficulty.

There is a curious feature in training which is seldom sufficiently appreciated except by the 'cognoscenti,—and that is the distinction which much be drawn between momentary or spasmodic, and sustained effort. The preparation for the one is often prejudicial to success in the other. For instance, in running, if a man were carefully trained for a mile race, he would probably deteriorate as a '*sprint*' runner, that is, a runner of short races, where the whole distance is travelled at full speed. In such cases the endurance gained by continued exercise over a long course is acquired at the sacrifice of a certain portion of the extreme quickness required for the short distance.

Leaving this section of the subject, I would revert for a few moments to a consideration of those general branches of physical education which will be of more interest to the natives of this country. It is often remarked that the youth of eastern countries, and especially of India, do not develope that taste for manly pursuits which is such a striking feature among all classes in Europe, and it is argued that the direct result is an effeminacy and softness in the manhood of the nation. Many Bengalees, we are sorry to see, plead guilty to the charge. An admission of the kind has before now appeared in a public journal. "We Bengalees, they say, are a peaceful, if you like, an effeminate race. Manliness, physical excellence, is not a thing we prize. God gave us brains instead; we are content to use them, and leave the development of thew and sinew to others." It may be that the Bengalees are what they would wish to represent themselves to be. But if so, they should cease allusion to their Aryan forefathers,—that line of conquerors which pushed its way westward and southwards, driving before them the outer barbarian, and introducing, as ages advanced, the civilisation of a nobler and more intellectual race. Through them we possess, if ethnologists speak truly, a remote kinship with you; but we, while we boast ourselves to have achieved a higher civilization than India has ever acquired, cherish our national intrepidity, foster manliness and the spirit of adventure in our youth, while we deny that we have been compelled to yield the patent of intellectual superiority to any kindred race. I do not say this to taunt any Bengalee, but I say it to show that there need be no decline in intellectuality, because the national characteristics for physical vigour and courage remain undeteriorated. You may treat the traditional kinship, the legends of Aryan conquest, the general history of the long vanished past as a myth, as old women's stories, but whatever may be the truth of our common origin, *we* can still point to ourselves as a nation which has achieved a combination of physical and intellectual excellence. We are therefore in a fit position to appeal to you to encourage manly pursuits and healthful exercises among your children. It is true we come here as conquerors, and our tenure of this vast empire is still secured by the sword. But we claim, that is, those who have the interest of the empire at heart, claim to have established large sympathies among you. The cause of the education of the masses has become a national question, exciting discussion, raising fears and hopes among you. Before we came, the people as a mass were inert, neither hoping for nor expecting education. You will all allow that in this great matter we have not stood still, though at times policy may have faltered in its advance; why then should you hesitate in a smaller matter like physical education, which will give health and strength to your children, and make them fitter for the battle of life. It is not surely that it is not in you. There are institutions in the country, under English auspices, where the recreation and exercises of the boys have their full share of attention, and in them the boys take to their out-of-doors amusements as gladly and fearlessly as English boys would. The boys have no fear, and if when they were passing from boyhood to manhood, the spirit that is in them were still fostered, and the effeminacy of the zenana, and the premature discharge of the functions of manhood were discountenanced, there is little doubt that the young men of good birth would lose that listless apathy, and distaste for physical exertion, which is so painfully apparent to English eyes.

Will it be a futile hope to expect that the exercises common in some of the institutions above referred to, will become current among native schools under native management. If the parents and the teachers will encourage such sports, rest assured that the boys will not make a difficulty. A boy, be he Bengalee, Rajpoot, or Sikh, enjoys a game, and few will venture to assert that it is not for his benefit. There are few games more innocent or excellent in their general character than English games, and they are not likely to interfere with any preconceived objections on the score of caste; but if there should be any objections to the games of another country, there are,—there must be, many national sports which only require encouragement to receive general acceptance. Encourage the best of these; let the boy live as a boy while he is a boy. We imagine the nursery rhyme—

> 'All work and no play makes Jack a dull boy,'

overrides any distinction of color and creed. Discountenance that fatal mistake—fatal, I believe, both when viewed from a physical and moral stand-point, of allowing a boy to become a father long before he has forgotten that he is a child, and you may rest assured you will be on the high way to remove any stigma which detractors would attach to the inhabitants of India on the ground of extreme effeminacy.

HEALTH.

1.—*The Drainage of Calcutta:* *By* W. Clark.

[Read on the 2nd February 1871.]

Physiologists inform us, that, by the strict natural ordinance, a man should know no more of his death, than of his birth,—that is to say, if he escape death by violence, he should go through a certain cycle of vitality, should sink into a second childishness or mere oblivion, and should ultimately die, knowing nothing of the fact of death. However true this may be as a mere theory, it is well known that it is seldom realized, as we live surrounded by circumstances which lead to disease.

It will, however, be generally admitted, that to attain the full period of human life, with that amount of happiness of which it is susceptible, there are several absolute requisites which a man must secure for himself; of these, pure air, and food are of the most vital importance.

The process of life in the consumption and assimilation of food, pollutes and thereby impairs the life-sustaining properties of the surrounding air. To counteract the evils resulting from this ever-present source of disease, the efforts of our reasoning faculties are necessary; and the deficiency or completeness of the means which have at various times been adopted, form the sources of incidents the most striking in the social history of a nation or community.

Probably in few countries has this been more strikingly exemplified than in the one we call "*home*," where accident, philanthropy, and scientific research have all contributed to enlighten us on the means to be adopted for the preservation of the public health; and also for mitigating, if not preventing, those terrible scourges which have, from time to time, spread death and dismay through the land.

It was accident which annihilated plague in London, and proved it to belong to the class of preventable diseases. Thus, during the seventy-three years from 1592 to 1665, London was visited by five great plagues, all of which are known to have been due to the impure condition of the town.

The accident which led to the great fire, led also to the rebuilding of the city and the disappearance of plague.

The mortality from cholera in our own times has been comparatively slight. Had the same *rate* of mortality prevailed as in the plagues of the 17th century, it has been computed that the deaths in the metropolitan district (which in the first cholera epidemic exceeded 5,000, the second 15,000) would have exceeded half a million.

Thus the great fire of London, which as a remedy the economists of the day would have been slow to adopt, proved to themselves and their descendants in its effects, the source of inestimable blessing.

It was philanthropy which induced the immortal John Howard to undertake the amelioration of the most depraved of the population. By unwearied exertion he made himself heard in the palace, and felt in the dungeon, which by him was converted from a legal sepulchre, the constant abode of fever, into a simple means of healthful confinement; and our prisons have since become models of sanitary perfection. Thus, in the year 1414, the gaolers in Newgate and Ludgate, and prisoners to the number of sixty-four, died of the fever, then called the "disease of the house." In 1577, the assize was held at Oxford, called in the records the "Black Assize," on which occasion all who were present in Court died—the judge, the sheriff, and 800 more—from a disease brought into Court by the prisoners. Many other instances may be given of the horrible state of the prisons of that day, where fever was bred, and nursed in the filth and foulness of the places in which prisoners were confined.

It is this disease, expelled from our prisons not only in England, but it is to be hoped in this country also, which still lingers under other names in the filthy and depressed districts of our large towns; raging sometimes with more, and sometimes with less, violence, but ready to assume the virulence of an ancient plague, where encouraged by want or misery, and fed by filth, or anything which tends to impair the purity of the air we breathe.

The careful and prolonged inquiries which, for the past quarter of a century, have been made by the direction of Government into the sanitary condition of the population, have discovered an amount of preventable disease and suffering, so surprisingly great, that legislative interference was felt to be imperatively necessary, to check the progress of the deadly evils proceeding from the foul, because undrained, habitations of the people; and to substitute, for preventable disease and misery, the health and happier condition which could be insured by the application of a few scientific principles.

The principal enactment for this purpose in England is that called the "Public Health Act of 1848," which has formed the basis for all sanitary legislation since, both in England and in the Presidency towns of this country.

The Health Officer's return for the year 1869 makes the mortality in Calcutta 33·9 per 1,000; and for the previous year, 36·4 per 1,000. These rates are very high, exceeding by nearly 50 per cent. that of the larger towns in England; and no doubt, largely due to the class of preventable diseases. I can give no statistics as to the relative proportion of preventable sickness to death. I am not aware that they have ever been obtained in a reliable form; but the enquiries in England appear to prove that the inevitable mortality, or that due to decaying nature and accident, did not exceed 23 per 1,000 per annum; and this limit was fixed, as that at which the Act could take effect; or, in other words, where the average mortality exceeded, during seven years, 23 per 1,000, there the Act could take effect; and it was lamentable to see how very few towns there were at the time where the Act could not take effect; where the population could rest with the comfortable conviction that all necessary precautions for the preservation of health had been taken, and that they were exposed to none of the unnecessary ills of mortality.

The Reports of the Medical Inspectors have proved the fact, that for every death in excess of the 23 per 1,000, there were in England twenty-eight cases of preventable sickness; and it has been estimated that the cost of this preventable disease equalled the whole public revenue of the country.

This was England, the home of most who hear me, where science and civilization have reached their highest stages of development, in the history of the world.

Grown wiser by the result of these inquiries, Englishmen have, during the past few years, been busily occupying themselves in setting their houses in order, and, under Providence, much good has been already done, though much still remains to do; and it is probable that, during the present session of the British Parliament, a much more comprehensive measure will be introduced, for regulating the drainage, and general sanitary condition of the United Kingdom; and will also give those larger powers to the Executive Government, which are necessary to enforce it; but which, in the comparative infancy of sanitary science in

1848, and even up to the present time, have been jealously withheld.

But it may be asked, how does the sanitary condition of England, in any way illustrate our condition, as dwellers in British India? Simply this, that the active agents, which are there abundant for the spread of disease, *viz.*, *filth* and *moisture*, are here even more abundant; and the temperate climate under which the decomposition of organic substances there takes place, engendering poisonous gases, is here replaced by tropical heat, and the far more rapid decomposition which it causes; in short, it appears that here, we have the sources of disease, if not in greater quantity, yet acting with greater intensity; rendering the immediate, rapid, and complete removal of all effete matter from the habitations of the population imperatively necessary. If this be regularly accomplished, so as to anticipate decomposition, then I conceive that the most important measure for preventing disease has been secured, and the atmosphere will be preserved, as nearly as possible, in its original purity.

I may here refer to the even now recent period when, in this city, the Fever Hospital Committee were engaged in their labours; one of the witnesses, Modoosoodun Goopto, whose evidence is given at page 9 of the Report, said: "The most unhealthy season of the year was from August to November; that during these months, the people suffered from intermittent, remittent, and bilious fevers, dysentery and cholera." The number of people who suffered from these diseases at that season amounted to about 500 in each thannah, including all classes of Natives and East Indians. It being remarked to him that this would amount to upwards of 18,000 people, he answered: "Yes, that though in some thannahs there were less, in others there would be more; but the average would amount to the number he stated, and the greater part of them were severely affected."

It being directly put to him whether he did not overstate the number, he said, "No, that although the number appeared large, the population of the native part of the town was great; that even in poor families there were twenty-five inmates in each house, and that he meant the total number in those four months." He said the fevers usually lasted from sixteen to twenty days, during which time the persons afflicted are confined to bed; that the greater part recover, and are able again to work, but that some continue sick for life. I am quite unable to say how far this was correct. It seems, however, in the opinion of this witness, that about one-fourth part of the population, within a period of four months, suffered from the diseases he mentioned. This was in the year 1840. Undoubtedly, the larger amount of sickness during these four months of the year, is due to the larger amount of moisture present, as an active agent, in the conveyance of malaria generated by filth, and the absence of all drainage, properly so called.

The result of the extraordinary labors of the Fever Hospital Committee, which extended over several years, was the erection of the building now known as the Medical College Hospital. It was intended, I believe, to confine the ravages of these preventable diseases within such bounds, as would enable the medical men to grapple with them successfully.

The Committee had also before them the evidence of engineers, and many excellent suggestions were made, but for a period of about fifteen years, literally, so far as I am aware, nothing was done; and I venture to say, even now, that very few of those who hear me, have the slightest idea of the amount of filth which is left on the surface, and in the ditches, to fester and rot, and to taint the atmosphere of this City of Palaces, and for the complete removal of which an efficient system of drainage is indispensable.

It was in 1856 that the scheme which I had the honor to present for the consideration of the Commissioners of that day, received encouragement from the Government; but it was not till April 1859 that the order to proceed with the works was given; since then it has drawn its weary length along, and even now, though I believe its success is admitted by all who nspect for themselves its operation, still wants the order for its completion.

I am perfectly aware, that the subject is one on which popular prejudice has been strong. I am conscious that from circumstances far beyond my control, there has been good cause for this; but I believe also, that this prejudice has proceeded entirely from a want of knowledge of the subject, not only on the part of the general community, but, also, with a few exceptions, of the arge number of gentlemen who have the control of municipal ffairs in their hands.

The drainage of Calcutta in all its details is a difficult and isagreeable subject to grapple with, certainly not inviting to he general public, and above all it is costly; it is felt in the municipal taxes to a considerable extent, and is credited, I believe, with a much larger share of pressure on the tax-payers, than legitimately belongs to it.

In order to explain, as far as I can, the general bearings of this important subject, I accepted the invitation of your worthy President to read this paper; and I have the more readily embraced this opportunity of speaking to the public of Calcutta, whose servant I am, and whose verdict on my short-comings I have had to bear, because up to this time, I have not had one single opportunity afforded me of expressing my views and opinions, in the discussions of my municipal masters, though the works designed by me, which they have undertaken, have already involved an expenditure of about one million sterling.

I am fully alive to the weight of the responsibility which attaches alike to them, and to myself as their engineer; but I mention this singular fact publicly, as one I believe without parallel, in the management of large engineering works of this character, and for the consideration of the third, and most important party to the arrangement, *viz.*, those who pay the taxes.

But my immediate object is to show, so far as I can, how the money, about 47 lakhs* of rupees, has been spent on the drainage works; to explain the principles of the system, in order that its operation and beneficial effects may be better understood; and help, as I hope to do their extension, to that part of the city where they are, and always have been most urgently required,—I mean the northern and exclusively native portion.

Before proceeding further, I may be permitted to say a word on the cost of the drainage works, which up to the present time has been about 47 lakhs, including 2¼ lakhs for the purchase of land.

They were commenced in 1859, when the house tax was 7½ per cent. It is now 9 per cent.

The lighting, police, and water rates are for specific purposes, and contribute nothing to the drainage. The carriage and horse tax existed before the works were commenced; this, with the licence tax, now yielding about 2½ lakhs† per annum, and the house tax, constitute the current revenues which have enabled the municipality to carry out, so far as they have extended, the new system of drainage works. From the same source the conservancy department, the repair of roads, surface improvements of every kind, and the pauper hospital, are also maintained.

---

* £470,000.

† £25,000.

The road repairs have cost about 3½ per cent. of the total assessment to the house tax; the conservancy department about 2 per cent.; street watering, imperfect as it was in 1869, upwards of 1 per cent.

It will probably surprise many, when to this list I add, that up to the present time, the actual pressure of the drainage on the pockets of the tax-payers has not exceeded 2¾ per cent. of the annual assessment to the house tax; which is less than the cost of the road repairs, and scarcely three times the expense of the imperfect street watering in 1869.

Moreover, the expenditure is made to include most of the surface improvements which have been effected. This 2¾ per cent. then, is the real magnitude of the extra pressure of taxation, which the owners of property in Calcutta have labored under, during the past few years, due to the drainage; and I mention this fact for general information, as these works are, I believe, generally held responsible for a much larger amount.

The term *preventable disease* which I have used frequently, at once suggests the question, how, by what means preventable? The answer to this introduces the subject of this paper—drainage—and more especially the drainage of towns.

All experience has proved that the active agents for producing the evil effects I have spoken of, are *localized filth* and *moisture*,—filth retained to pass through all the stages of decay, and moisture by its evaporation to convey dissolved within itself, the organic poisons, or ultimate germs of disease.

To remove all effete and noxious matters capable of being conveyed in running waters, rapidly, completely, and continuously, as they are produced, from within the boundaries of a town, to a sufficient distance outside of it, is the first object of drainage; and the plan to be adopted depends entirely on the peculiarities of the site; thus a rocky hill station, like most of our Indian sanitaria, or a town built on a gravelly soil, elevated more or less above the surrounding country, require totally different treatment, from that of Calcutta, Bombay, or Madras.

The natural facilities for the drainage of towns built on elevated, rocky, or porous sites, have not unfrequently led to great evils. Thus Ramsgate, a large town on the east coast of England, built on the chalk cliff, the resort of numerous health-seeking visitors from London, only a few years since, had no drainage properly so called; the plan generally adopted was to sink a dry well into the chalk, to no great depth, within which all the fluid filth of the house disappeared in a most wonderful way, and for a long time; the chalk contains numerous cracks and fissures, through which the fluids could travel long distances; they did so, into the wells from which the water was pumped for domestic use, and from a lower level. The effect of this pollution was to render a favourite place of resort, with all its natural advantages as a sanitarium, an unhealthy place, by saturating the site with filth, and polluting its water supply: many and severe were the fights that had to be fought there, as elsewhere, to obtain a better and more salubrious state of things. Though opposed to common sense, and to such obvious and simple principles, that any one might understand them, yet the absence of any decided outburst of sickness to frighten the resident population, became to them eventually, what they considered safe experience, and they resisted the change to a better state of things, which involved expenditure and extra taxation.

I can mention another instance more immediaetly within my own practice, while in England in 1868. In the month of January an outburst of typhoid fever occurred at a pretty village called Terling, in Essex. After a long period of drought a very heavy rain fell, and the wells, while many of them had been dry, were suddenly filled. The village may be generally described as built on the side of a valley in the London clay, with a small stream, called the river Ter, flowing along its bottom; the hills on both sides are capped with gravel; a porous soil resting on a retentive one, most favorable for the accumulation of water; the junction of the two is indicated by a line of springs on the sloping sides of the valley; near this line as a matter of economy the wells were sunk. Not far distant, but for the most part in the gravel, the place for filth was dug, from which the rain water and other fluids could easily escape by soakage. On the occurrence of the heavy rain I have alluded to, undoubtedly the water which collected in the wells had, to some extent at least, passed through the filth-sodden surrounding soil. A fortnight afterwards the first cases of fever occurred; about one-third of the population suffered from severe attacks of the terrible disease; out of the population upwards of sixty died, and there were but few families attacked, that did not lose one or more of its members within three months.

The visitation will be long remembered in that part of England: it was clearly a preventable disease, and due to the pollution of the water of the wells.

The Government were compelled to interfere; the Poor Law Board sent down their medical officer, to enforce all the measures that were immediately necessary, and the engineering advisers of the Government did me the honor to nominate me to carry out the works of prevention. A water supply was collected from distant springs, and raised by power obtained from the river Ter, by a water wheel, and forced through pipes for distribution. A small drainage work, of stone-ware pipes exclusively, was also carried out; and both, on the occasion of my last visit, were in successful operation; but the villagers, though they use and approve the new water supply, still declare that the sickness from which they suffered was not due to the old one.

I need not, I think, multiply instances, to prove that Simla, or Ootacamund, and Calcutta should not be drained on precisely similar principles; there are scarcely two cases which are precisely the same. Thus Calcutta, which stands on the bank of a tidal river, with a considerable portion of its surface scarcely above the level of the highest spring tides; and a subsoil consisting for the most part of fine silty sand, saturated with water, requires a scheme especially suited to its physical position; in fact, the end to be obtained in the drainage of Calcutta, is very like the natural state of things in a favored locality. First, the subsoil must be drained, to render the foundation of houses dry; next, the excavations must be made so deep in places as to give the necessary fall to the sewers, which fall exists naturally on the undulating surface of the favored locality; and lastly, the storm water which will run and escape naturally by gravitation from the undulating and elevated surface, must be received into channels of some sort, and conducted to an outfall, either natural or artificial: all this involves a large expenditure of money. Moreover, it will be at once seen, that the expense of such works, if reckoned per head of the population, must increase with the extent of the area to be drained, because the works must inevitably extend in the larger and therefore more costly direction, to afford the required capacity for discharge.

I shall now proceed to describe, as well as I can, the general arrangement, and some of the details of the scheme for draining Calcutta.

You are all familiar with the general features of the city. It is bounded on the West by a tidal river, the Hooghly; on its North and East by the Circular Canal; and on the South by Tolly's Nullah; it is only on a portion of its Eastern side that the open country is not cut off by some navigable and tidal stream.

The surface of Calcutta has an inclination of nearly three feet per mile from the river towards the East.

The highest water in the Canal, is about four to five feet lower than that in the river; thus the best natural outfall for storm water, because subject to the least tidal obstruction, is towards the East. This is an important peculiarity in the site of Calcutta, as it allows of a natural, or gravitating outfall for heavy storms, though the nearly flat, and depressed surface, necessitates pumping, or an artificial outfall for the sewage at all other times, and during the dry season.

The most advantageous arrangement, therefore, was to follow the natural though slight inclination of the surface, and to lay out a system with its general inclination towards the East as the surface falls; and this has been done.

The plan shows five large sewers extending from the river through the town to the East, and all uniting in the Circular Road at the end of Durrumtollah Street.

These are the *first class* sewers; their inclination is from two to three feet per mile, and about that of the surface under which they are laid. This small inclination has a double object; it permits the escape of storm water into the river whenever the tide will permit, and it enables these sewers to be more or less flushed, if necessary, twice nearly every day in the year, by admitting the water from the river.

This is occasionally necessary, because the small fall given to them barely suffices for the removal of the heavy sandy solid matter, which is washed into them from the road surface.

Into these large sewers, the *second class* sewers are discharged; the general arrangement of these latter, is to divide the surface of the city into square areas, by placing them under the leading thoroughfares.

They have a minimum fall of six feet per mile, sufficient to insure their self-cleansing action, when receiving the storm water, and the drainage in the dry season from private dwellings, when furnished with a sufficient water supply.

Into these *second class* sewers the smaller *third class* or pipe sewers discharge; they are laid into all the narrow and tortuous lanes and streets of the city, and their inclination is from 1 in 400 to 1 in 100, or at the rate of from 13 to 50 feet per mile.

The total length of the sewers when entirely completed, and as executed to the present time, will be as follows:—

	Total length at present.	When completed.
First class	... 5 miles ...	10¾ miles.
Second class	... 11¾ ,, ...	23 ,,
Third class	... 10 ,, ...	79 ,,

It will thus be seen that one-half of the more expensive class of works is already completed, while the outfall works, with the exception of one pumping engine, still required, are finished.

It has been urged that it will be impossible to carry these smaller pipe sewers into the northern part of the city, where the lanes are so narrow and tortuous. To this I can only offer my judgment and experience: I am of opinion that they can be. I admit the difficulty, and it requires the greatest care not only in the execution of the work, but in arranging it.

I find that every street has its peculiarity, as to width, and the character of the buildings on its sides; all these have to be carefully noted and considered, when laying out the line, and inclinations. I have now so examined a large area of the closest built part of the city, and I have never yet found a portion in which, if the danger to buildings was great, that I could not by some other arrangement avoid it, and still accomplish the end I had in view.

Moreover, I can now point to an area in the southern division of the town actually drained, and the sewers in constant and successful operation. I allude to the area between Free School and Wellesley Streets; it is almost exclusively inhabited by a native population, and the lanes are narrow and tortuous. By a fortunate combination of circumstances, the order to drain this portion was obtained in April 1869; the middle of the hot season, to commence a work of this nature, is most undesirable, but it was successfully completed, so far as the public portion of the works are concerned, within the following cold season; and now presents a fair specimen, not only of benefit to be derived from the drainage, but also of the possibility of effecting it. I can state with very considerable satisfaction to myself, that up to the present time, out of the nearly forty lakhs expended on works executed by my own establishment, not 500 rupees has been required to pay for damage to property; and I believe, that though we cannot expect to escape entirely expenses of this character, in the further prosecution of the works, should they extend to the northern portion of the town, yet I feel very confident, that with the experience now obtained, no serious difficulties of this nature will arise.

The office of the sewers whose general arrangement I have described is threefold—

1st.—To remove the subsoil water.
2nd.—The drainage of houses.
3rd.—The rain water.

The first of these is by no means the least important. If a hole be dug seven or eight feet deep, in almost any part of Calcutta, remote from one of the sewers, and it be carefully observed during the varying seasons of the year, it will be found that the surface of the water, which will immediately collect in it, will vary from a few inches below the surface of the ground in the rainy season, to a few feet, at most five or six, in the month of May. Such trial holes will show only a trifling difference in different localities; only a few days ago, in Canning Street, where a new first class sewer is being laid, and at present incomplete to its outlet, I saw the sewer literally drowned, covered over with water of the subsoil, which stood at about two feet from the surface. When the outlet to this sewer is completed, this subsoil water will disappear to the level of the invert of the sewer; that is, it will be reduced to a level about ten feet lower, as a hole dug in its vicinity, would show; and other such trial holes would show a lower level of the subsoil water surface, varying with the distance from the sewer.

It is this subsoil water which causes damp houses; which by its evaporation produces a damp atmosphere, and it is in consequence of its usually greater depth from the surface during the hot weather, that the superior healthiness of that season is, I believe, attributable; hence the deeper the sewer the greater its efficiency for this purpose.

Secondly.—The sewers are intended to remove the house drainage, and this includes all the filthy water from the cook-room and stables, all fæcal matters, bath-room water, &c., &c., and is in quantity usually estimated by the water supply. For this purpose, and for the removal of rain water, small stone-ware tubes are laid from the houses to the sewers, and never with an inclination less than 1 in 120: this fall is found to be sufficient, but more is desirable, and can be obtained in almost every case.

The third office of the Calcutta sewers is to remove the rain water falling on the surface, and their capacity for discharge is calculated to be equal to ¼ inch of rain per hour. This is an enormous quantity, and would, if collected, be represented by a running stream 40 feet wide, 8 deep, and flowing at a velocity of 4 feet per second.

Among the criticisms which have been passed on the system, is the enormous size and cost of the sewers to convey so large a quantity; it must, however, be provided for in some way or other; either new channels must be formed, or the abominable ditches, and side drains as they have existed for many years, must be allowed to remain,—this I think few persons would advocate, as they would undoubtedly be, as they are now, stagnant receptacles for filth, a source of nuisance and disease; in fact, any scheme which failed to render them unnecessary, would, I think, be liable to the charge of a want of a completeness, and therefore of success. As, however, some provision must be made for conveying away the rain water, the question resolves itself, into the reconstruction of these ditches, and surface drains, for this especial purpose, or the combination of the entire drainage waters, that of storms with the house drainage and the subsoil water.

The result of a careful inquiry as to the cost of the separate and combined plans induced me in 1855 to adopt the latter course; and I have seen no reason since to alter my opinion. As, however, there are many advocates for surface drains, I will here pause to inquire what those surface drains would be like. Granting that they would fall into the river at one end, and the canal at the other, it would be inevitable that the greater number of them would be nearly two miles long. Now to carry away the storm water and the road debris, and keep themselves clean, they should have a fall of not less than six feet per mile. It is very evident then, that when two miles long, they would be about ten to twelve feet deep at the lower end; and if only one mile long, five or six feet deep: they would, in fact, be dangerous chasms occupying a considerable portion of the road surface; and if covered, they would form a second system of sewers for storm water.

pose their fall to be reduced to three feet per mile, then must their capacity be largely increased, and occupy most inconveniently a large portion of the road surface.

Again, it will be seen that upwards of two-thirds of the entire ength of the Calcutta sewers will, when completed, not average a larger size than a 12-inch stone-ware pipe; few people will, I hink, be found to quarrel with this as being too large.

The whole objection then, as to the size of the sewers, is comprised within one-third of their total length; but this must be till further reduced, because with the disappearance of the irst class sewers from the scheme, a total alteration in the rrangement of levels would be necessary, reducing the fall f the whole, or involving greater depths at the pumps, and ncreased cost of pumping: this would be highly objectionable. To preserve the present level and falls, the arrangement must be reserved also, and this would involve, under any circumstances, the construction of large brick sewers in the position of the first class, having the same fall as these have, and upwards of one-third of the total length of the present brick sewer arrangement. The question thus becomes still further narrowed to the point whether twenty-three miles of deep brick sewers shall be constructed, out of 113 miles, or about double that length as a separate rain water system only, nearer the surface? I think any one who can follow me in what I have said, will see that the plan of greatest economy, and I am quite certain of efficiency also, has been adopted.

I cannot omit to notice still further, that surface drains have many advocates, because they can be cleaned so easily. To require regular cleaning, presumes that they must be as regularly filthy, and this is proved by experience abundantly in Calcutta. Wherever a surface drain exists in the neighbourhood of the residences of the poor, it is made use of to contain filth, and though the filth may be washed away regularly every morning, yet for twenty-three hours out of twenty-four, the surface drain is simply an evaporating basin of noxious matter. In the area between Free School and Wellesley Streets to which I have alluded, and to which I invite your especial attention, no surface drains have been put in by me. The expense, and the nuisance arising from them, have been both avoided.

I may now mention some of the details connected with the sewers in the town. In order to inspect their operation, to detect and remove obstructions, should they occur, SIDE ENTRANCES to the brick sewers are provided, about every 1,000 feet, and near to junctions. Besides this mode of inspection, all the sewers, whether of brick-work or stone-ware pipes, can be opened from the surface at MAN-HOLES situated not more than 200 feet apart, and covered with a cast-iron cover; these man-holes admit of cleansing operations, should such be necessary, without breaking up the road. Thus every part of the system is capable of being examined and cleaned.

The sewers are also provided with ventilating grids; these are fixed in the centre of the roads; their office is to allow the escape of the air from the sewer, on the occasion of any sudden rush of water into it, which would of course displace a quantity of air equal to itself in bulk, and so prevent the passage of air into the house drains. As a further precaution against this latter contingency, some few iron pipes have been fixed in places considered unobjectionable, by which an interchange of the sewer and the external air can gradually take place, and the diffusion of the former be effected. When the whole system of sewers is fairly in operation, and made to convey away fresh filth, I am certain that the general adoption of this plan would be productive of no nuisance whatever, and the most abundant ventilation possible would be obtained as the result. But while they are as at present, temporarily I hope, made to convey filth in a state of decomposition, I do not think this addition to the ventilation is desirable, and it has not been extended.

GULLIES.—These are Pits situated for the most part just outside the kerb stones of the foot-path. They are from six to eight feet deep, for the purpose of receiving the storm water, as it flows from the street surfaces, through the iron grids which cover them; an overflow pipe is connected with the sewer from near the top of the gully, and the heavy particles of road grit are thus arrested. This deposit is excavated from time to time; notwithstanding this, however, some hundreds of tons of road grit finds its way to the pumps on the occurrence of every shower.

HOUSE DRAINS.—Every inlet to these is guarded by a grating, and a pit or trap acting on the syphon principle, so as to admit filthy fluid to pass inwards, but prevent the escape of the air outwards.

Many persons look upon these arrangements with suspicion, as a means of conducting impure air into the houses from the sewers. To prevent this, however, the house drains are furnished with an especial trap, near the inlet to the sewer, which effectually prevents it; there are also other ways of preventing sewer-air from entering the house. The diagram shows one mode of admitting the bath-room water of an upper floor into the sewer without risk of this result: soil pipes should always be carried up to the highest elevation, and left open for ventilation.

FOOT-PATHS.—There are no doubt many persons here who can remember Calcutta as far back as 1856; there were then no foot-paths, but an open ditch disfigured even the Chowringhee Road for nearly its entire length.

The foot-path was suggested by me to protect the gas pillars first fixed. About that time many were the discussions, and great was the opposition to the Chowringhee Road foot-path, which was the first. Prejudice was strong, but the Commissioners of the day were firm, and the gas pillars were set well out into the road, protected by the path, and doubtless diffuse a better light than they could do from a short bracket fixed on to a dirty wall. Prejudice has been so strong indeed on this subject, that even now people may be heard to declare that the natives never use these foot-paths;

this is simply contrary to the fact; wherever the foot-path is so good, as to be more comfortable to walk on than the road, there it is used; but when the road is the best, then the foot-path is deserted—a very reasonable discrimination on the part of the native pedestrians.

The foot-paths have, however, other objects. Thus they form an elevated and therefore dry surface when the road may possibly be wet by heavy watering, or flooded with rain; it forms a gutter for collecting the surface water, and its conveyance to the sewer in the centre of the road by a shorter channel: it is also economical, there is less surface of road to repair with expensive metal, less surface to engender dust and keep watered, and lastly, it actually costs a trifle less than the surface drains, which have, as I think by mistake, been put down in such streets as Harington and Middleton Streets, Middleton Row, &c., &c.

The question of foot-paths is really a most important one, by no means difficult to understand, yet generally misunderstood; therefore I may, I hope, add a few more words on the subject

A constant remark is that the road is too narrow for a foot-path; now this is certainly not in all cases an argument, as in some of the narrowest streets where the traffic is heavy, both of pedestrians and vehicles, there the foot-path is *indispensable* because the streets *are* narrow; this is the case with most of the narrow streets in the City of London; and it pertains here with nearly the same force in Bentinck Street, and some of the narrow streets by the Strand, where pedestrians cannot with safety, nor without considerable delay, make their way along.

Generally speaking, it may be observed that any difference between 16 feet up to 23 feet width of road, is available for foot-path, because two carriages can pass each other in 16 feet, and three carriages could not pass in less than 24 feet, if moving fast; thus the width of the carriage ways generally run in multiples of 8 feet, and any balance will be available for foot-path. When the carriage traffic is small, then in my opinion the greatest width that can be given to the foot-path, is the greatest improvement; and as I have explained, it is a matter of decided economy so to arrange it.

I have now generally described the system of sewers within the town; and it remains to describe the outfall works from the point of junction between the Circular Road and the Durrumtollah main sewers. At the end of the latter street, the three are all united in one called the 'Canal outfall Sewer,' as it occupies the position of what was formerly the Entally branch canal;

this canal terminated in what was generally known as the cess-pool of Calcutta—an accumulation of filth happily no longer existing—not far from the Circular Road.

This CANAL OUTFALL is a formidable work; it is 3,284 feet long. Its construction became necessary in consequence of an order of the Bengal Government, which fixed the neighbourhood of Palmer's Bridge as the limit, within which the pumping station would not be permitted; moreover, the portion of the drainage works then constructed was not allowed to be used, until this large sewer, and the whole of the outfall works were completed. This was in May 1861, and undoubtedly considerable delay in testing the efficiency of the scheme by actual use, was thereby incurred; [illegible] also a large additional expenditure of money, on works [illegible] up to that time, were considered experimental only.

This canal outfall sewer has a fall of two feet per mile, and at its lowest level is 15 feet below the average level of spring tides during the rainy season.

SILT PITS AND PUMPING STATION.—At its eastern end, the canal outfall sewer bifurcates, each of its continuations is protected by a gate; and either or both of them can be used as occasion requires. Just within the gate, the invert has a sudden drop of three feet, and then falls to a further depth of eight feet; thus two large receptacles, 150 feet long, are formed with a sloping bottom, to the eastern end, and each becomes a pit in which silty and solid matter is arrested. This provision was made in conformity with the orders of Government, and to prevent the silt, as far as practicable, from being washed into the canal on the occasion of storms.

The eastern ends of the SILT PITS, as this arrangement is called, are protected by another pair of gates like those before alluded to, but taller to shut out the canal water; they can be lifted by suitable gearing from above. The intention was, if need be, to allow barges to enter from the canal to take away the silt; this, however, has been unnecessary, and the gates are only used during the time of heavy storms, when the engines are overpowered by the quantity of water coming down from the town; they are then lifted and the storm water escapes into the canal. Under the gate platform a culvert is constructed, leading to a well, from which also the suction pipes are laid; by this arrangement either pump can work either pit.

The pumps and engines are combined, the former on the centrifugal principle. All the parts of the engines and pumps are secured to a large vertical tank, at the bottom of which the centrifugal disc works. The action is this: the disc receives the fluid at its centre, and revolving with great rapidity, throws it out at the periphery, with a force, which causes it to rise within the tank, to such a level as to overflow into the high level sewer, which conveys it from the pumping station to the Salt Water Lake. As it escapes from the pumps it passes through a surface condenser connected with the engines, and by this means the condensation of the steam, which works the engine, is effected.

The large quantity of silty matter conveyed by the sewers to the pumping station, rendered some especial provision for its disposal necessary; this is effected by the SILT AGITATOR. The apparatus consists of a series of pipes laid along the invert of the silt pits, and to every part of the arrangement where silt is likely to occur. These pipes are furnished with nipples. They are connected with a pair of air blowing cylinders, and a pump worked by a small auxiliary engine; by these means air, or water can be forced through the pipes, which escaping at the nipples, puts all the silt and fluid around them in a state of ebullition, and mixes them up in a state to be pumped.

The surface condensers are also kept clear of deposit in the same way. The chambers over the pits are now generally kept closed, and are ventilated by a flue, which conveys the air from the pits to the boiler furnace, through which it passes to the tall engine chimney. The entire pumping, and agitating arrangement was manufactured by Messrs. Easton, Amos and Anderson of Southwark Street, London, and has worked most satisfactorily.

The high level sewer is 8,284 feet long, and is capable of conveying about two million gallons per hour; its fall is four feet per mile; it terminates in an open excavation through the one square mile of area reclaimed from the Salt Water Lake, which is 8,900 feet long; and at its eastern extremity, distant 3¾ miles from the Circular Road, this open channel communicates with a natural stream.

An enormous quantity of silt has accumulated in this open channel during the past two years, and by far the greater part during the last rainy season. A careful measurement shows it to be no less a quantity than 14,00,000 cubic feet which has passed through the pumps, and necessitates the re-excavation of the channel immediately. It chiefly consists of the debris from the road surfaces of Calcutta, mixed with feculent matter; this large accumulation proves the power of the streams running in the sewers to transport it, and to keep them clean; they have done so to the present time, in a most satisfactory manner: the result is precisely that which was intended.

Some sanitarians still look with doubt on this means of disposal, and are apprehensive that the large quantity of sewage so voided into the locality, called the Salt Water Lake, will be productive of evil consequences. This mixing of the sewage with the natural stream is, however, absolutely unnecessary, and may be avoided, by its utilization on the reclaimed area, which was taken up for this especial purpose; this area may be extended as necessity requires hereafter; as the 28 square miles of the swamp, called the Salt Water Lake, is more than sufficient for the purpose.

Another plan has, within the last four or five years, been proposed for the removal of feculent matters from towns, by what is called the dry conservancy plan, and the use of dry earth.

This has been proposed for Calcutta, as a better and safer method of accomplishing the end in view; and, on the merits of this plan, supported by high authorities, the question has been made to assume the form, Which of the two should be adopted,—the modern dry conservancy, or the antiquated fifteen-year old water-carriage system. Undoubtedly, these arguments have had the effect of causing delay in the execution of the works, by raising the doubt, whether a something better has not been discovered, the adoption of which, would render the expenditure on the drainage works unnecessary.

Nothing I can conceive is more erroneous. Granted, for sake of argument, that the dry conservancy is carried out for the whole city at an annual cost of 20 lakhs,[*] would the drainage of the city, then, be accomplished? Would not the house drainage of fluid filth, as represented in quantity by the water-supply, still have to be provided for? As also the sub-soil drainage, and the storm water? In order to show the proportionate quantities of these several fluids, I have prepared a colored diagram, the centre spot of which shows the quantity of feculent matter,—the next circular area, the house drainage,—the next what may be assumed to be the sub-soil water; and the largest circle, the daily quantity of the storm water equal to ¼ inch per hour over the whole surface. The centre spot is, therefore, as a drop in the bucket; and when providing for the other fluids, the inclusion or exclusion of this really makes not an iota of difference.

£200,000.

The question of expense, is regulated by the question of capacity entirely. The necessity for a system of sewers for Calcutta is, therefore, entirely independent of this question of dry conservancy; having the sewers, the point can be determined whether this matter shall be received or not: in all English towns it is; in Paris it is not; but who that knows Paris would venture to say that it is as sweet even as London. They have a system peculiar to themselves, but they have the sewers nevertheless.

On the subject of dry earth conservancy, I have not one word to say in disapproval. It is suited especially to small villages in England, and elsewhere, if the people could be got to think so. It is suited also for any comparatively small place where labor is cheap and well under command,—such as jails, &c.; but for a large city, like Calcutta, on the score of expense alone, it is simply impossible; it is especially unsuited to the habits and feelings of the great mass of the population; and according to my opinion, it is unnecessary.

These then are some of my views on the subject of the drainage of Calcutta. It is a subject of the greatest importance to every member of the community, and especially so to that portion of it who are by far the most numerous,—*viz.*, the poorer classes. Their welfare is in the keeping and under the control of the rich, and I think it should not be viewed simply as a matter of money.

The subject is especially one which should receive consideration at a meeting like this, convened to inquire into, and promote questions of social science; and if I have been able to explain my views so as to be better understood, than I believe they have been, I shall be most thankful for this, my first opportunity, during fifteen years, of advocating the claims of this important subject on the public attention, and in a public meeting.

DISCUSSION.

[March 25th, 1871.]

The President rose and said that the first subject to be taken up by the meeting was the discussion of Mr. William Clark's paper on the Drainage System of Calcutta. To those among us who are permanent residents of the city, this was a subject of immense importance. The objects for which so much money had been expended, and for the complete fulfilment of which a good deal of more money would be demanded, were the improvement of the sanitary condition of the town and of the public health. That, as far as the system had been carried out, under the direction and supervision of Mr. Clark, this had been the result, must be patent to the observation of all who recollected what the state of the Southern Division of the city was prior to its being brought into active and successful working order. Down to the period, when all the surface drains were filled up, and the drainage diverted into the under-ground system of sewers, the insanitary condition of the streets was so disgusting and abominable, that pedestrians and others who traversed them were everywhere, and at all times, accosted with smells of the most depressing and sickening description. Although the drainage of this division was still not so complete as was contemplated in the original design of Mr. Clark, yet the improvements which had already been effected were manifest. The ultimate completion, however, of the scheme is only a matter of time.

The system of drainage projected by Mr. Clark is a modification of the under-ground sewerage, which has been carried out in hundreds of towns in Europe. The Chief Engineer to the Calcutta Municipality has avoided some of the cardinal errors committed in England and elsewhere. He has provided against the pollution of the Hooghly by diverting the drainage from, instead of into, the river. His scheme involves the outflow of the ordinary and extraordinary drainage liquids along the gentle decline of the land on which the city is built towards the Salt-water Lake, whilst a further slope has been artificially created to give the channels sufficient fall to enable them to conduct their contents rapidly towards their destination. In this way, not only are the sewerial matters quickly removed, before much decomposition has had time to set in, but, with an adequate supply of water to flood the same, the channels are kept free and open, and the risk of stoppage or obstruction from silting reduced to a minimum. Another circumstance which should be borne in mind is, that the system provides for the removal of the storm-waters, the great volume of which must also help materially to scour out the sewers, and to maintain them in a comparative state of purity and wholesomeness. And when, from deficient supply of water carriage, blocking up may be threatened, means have been supplied for the flushing of the sewers almost to any extent, during the height of the ordinary tides from the river Hooghly. It should also be remembered that, owing to the facilities for flushing the sewers, a smaller slope has been adopted than would otherwise have been found indispensably necessary, thus, *pro tanto*, diminishing the original outlay in their construction.

Mr. Clark has been censured by some of our friends, in the capital of Western India, for going to the expense of carrying off the storm-waters through the sewers. It is said that these waters might have been better transported by surface drains. But as surface drains are always, and especially in India, liable to be constantly contaminated with filth, and as, to render them even partially effective—for completely effective, they would never be in this town—the cost of their construction would have been more than the additional outlay incurred for the purpose of removing the storm-waters along the under-ground sewers. There can, I think, be no doubt that Mr. Clark has used a wise discretion in discarding them, and substituting clean and healthy foot-paths in their stead. Open drains are always a nuisance in the towns of all countries. They are deadly in a tropical city like Calcutta.

Much has also been made out of the influence of the sun in neutralizing the evil consequences arising from open drains. But in the narrow gullies and lanes of the native part of the town, this great deodorizer and disinfecter never gains direct access to the contents of a large number of the open drains. In other situations accessible to the powers of the sun's rays, this influence is in abeyance over a period of more than one-half of the twenty-four hours. As, by the Calcutta under-ground sewers, the materials flowing through them, can be landed at their destination, three miles to the eastward of the city, before decomposition to any material extent has commenced, the consequences predicted to arise from decomposition within the sewers are more imaginary than real. Any amount of putrefactive change which may occur must surely be neutralized by the great facilities which have been provided for reflushing the sewers to almost any extent that may be desired.

The office of the sewers is (1) to remove sub-soil water; (2) to drain the houses; (3) to remove the rain-water. All these objects are fairly accomplished by these sewers. Much care and watchful supervision will be necessary in connecting the houses with the sewers. Difficulties may present themselves in the completion of this part of the system. But I trust that Mr. Clark will be able to meet and surmount these difficulties.

Then, again, there is a problem to be solved as to the best and least offensive plan of disposing of the material at the end of the high level sewer on the western border of the Salt-water Lake. Unless this difficulty is soon overcome, the neighbourhood of the outfall must become unhealthy in the extreme. Reclamation and the utilization of the sewage would seem to answer the objects in view. But, at any rate, it is manifest that, in the meantime, it is better to have the filth of Calcutta taken away, in a tolerably inoffensive way, to a distance of three miles, and there to be deodorized by the sun's rays, and I hope to be utilized, than to allow it to fester and decompose in open drains, in the soil, or compounds of houses for a time, thus poisoning air, earth, water, and food with products of the most deadly nature.

The Calcutta drainage system does not poison any source of water-supply used by the community; it does not contaminate our noble river as the Thames used to be poisoned in its passage through London by the sewage of the city, or, as the Clyde, at the present day, is polluted by the sewage of Glasgow. It improves the sub-soil drainage in a way which must increase the healthiness of the ground floors of houses during the dampest months in the year. It carries off the sewage matters from houses, and the storm-waters, in a comparatively inoffensive manner, leaving little or nothing to the carelessness or caprice of individuals, and takes these materials three miles from Calcutta, to a situation from which the wind seldom blows during epidemic seasons of the year. It does this too, so far as my observation goes, before any material amount of decomposition has had time to set in. It lands these materials in a locality gradually undergoing reclamation by a slow natural process, where they can, I trust, under good management, be turned to profitable account, by being utilized to expedite that process of reclamation. It appears to me that only capital and engineering skill are required to convert what must, if neglected, eventually become a nuisance into a most remunerative undertaking.

Gentlemen, the great interest which I have always taken in sanitation has insidiously induced me to say more than I originally contemplated. I trust anything which I may have spoken in approval of Mr. Clark's system will not deter any one here from exposing defects, should these be found, or be supposed to exist. A healthy opposition in science, as well as in letters and politics, does good. I may state, in conclusion, that Mr. Clark invites the most unsparing criticism of his plans and schemes. Before sitting down, I take the opportunity of asking the visitors, who have favored us with their presence, should they think fit, to join in the discussion.

Dr. Chuckerbutty said:—Mr. President and Gentlemen,—Mr. Clark's drainage scheme so entirely meets with my approbation that I might have well remained silent upon the subject. But as it might be said that Mr. Clark's paper was passed over without any discussion or consideration, I am forced to speak if only to show the intense interest I feel upon it.

The principles enunciated by Mr. Clark were nothing but what had been accepted all over Europe. The ends to be attained were, as he has pointed in his lecture,—1*st*, the removal of the sub-soil water; 2*nd*, house drainage; and, 3*rd*, the removal of storm-water. We will take first the sub-soil water, scarcely three feet below the surface, which looks so good and dry; there is in Calcutta a soft black mud saturated with salt-water which held in solution every species of poison to give it out in the hot season under the powerful rays of our tropical sun, and during the rains with the vapours which were continually rising from the over-saturated ground. Mr. Clark has quoted Pundit Madusoodun Gupta to show that diseases were most prevalent in Calcutta from August to November. I have taken some trouble myself upon this subject, and I showed some years ago that diseases in Calcutta were twice as rife during the rains as during those months, though not so fatal. The greatest mortality is attained during the winter. The increased sickliness during the rains is so well known that every European who can afford it flies to the Hills or to Europe during that season.

We will take now the storm-water. The storm-water is partly absorbed by the soil, partly evaporated, and partly carried off by the drains. Now it stands to reason that, if the sub-soil water is not drained, there can be little or no absorption by the soil; and if the drains are bad, the storm-water cannot be efficiently carried off by them. . The truth of this will be evident when I refer you to the state of Calcutta after a heavy shower before the commencement of the drainage operations. Nineteen years ago nothing was more common than to see the streets of Calcutta completely flooded on such occasions. I say nineteen, but I might easily speak of twenty-eight years, as my experience extends as far back as that. Even so late as 1864, when the great Cyclone occurred before the new drains came into operation, Calcutta was so flooded, including the maidan, that large masses of straw floated down the Dhurrumtollah Street; and when I attempted to go out to see a patient, my progress was stopped by the pit of my carriage getting under water, and my horses not being able to proceed. Nothing of this kind has occurred since the new drains came into play.

We will now take up the house-drainage. This not only means the removal of the waste-water, but also of the night-soil, and a variety of other abominations. My native friends will understand me when I refer them to the Courtyard of their zenana. This Courtyard is the receptacle of the dirty water and every kind of refuse. All this is ultimately thrown into a tank within the compound, or into the street sewers, which are no better than stagnant ditches. Their privies, too, are in some cases constructed upon these tanks or public sewers, and this, though the water of the tank might be used for bathing, cooking, and washing. Could anything be more disgusting and uncongenial to native ideas?

Is it then a matter of no importance to our native friends to avoid all this inconvenience, disgust, and insalubrity? Of great importance most assuredly. I am in the habit of visiting, in the pursuit of my profession, the houses of the rich, as well as of the poor, in both divisions of the town, and I frankly confess that, in the Southern Division, wherever the drainage works have been brought into play, the dwellings even of the humblest cottagers is in an infinitely better sanitary state than the mansions of the richest millionaires in the Northern Division, where the drainage operations have not yet been extended. Permit me to say before I conclude that, before the completion of the water-works, and the partial operation of the new drainage-works, the mortality in Calcutta from dysentery, cholera, and fever was most appalling; and as I have myself written something upon that subject, I will let you know the facts. When I wrote my paper on dysentery in 1865, that disease was so common and so fatal, that sloughing cases of it were of daily occurrence. Such cases of dysentery are now rarely to be seen. My annual share of cases of cholera in the Medical College Hospital, before the completion of the new water-works, was about 700, and I declare to you that, during the last eight months, I have scarcely had a dozen cases of that disease. Fever, too, has decreased during the same period in a like manner. I will repeat to you therefore that Mr. Clark's drainage scheme meets with my entire approbation. It has been a success, not only in the town, but also in the Salt-water Lakes, where a square mile of land, through which the sewage thus runs, has been reclaimed, and from being unproductive, has been converted into smiling paddy-fields, from which the Municipality derives a revenue, and the contractor or contractors a large profit. We know that London was a very hot-bed of plagues, pestilences, and fatal diseases of all kinds before the introduction of the drainage operations, and after that there was so immense an improvement, that people were only too thankful for it. It was only after many years, when the Thames had run unusually low, that any defect was perceived, and that because the sewage was discharged into the river above London. Yet the stench was so strong, and so near the houses of Parliament, that it was decided to remove the point of discharge of the sewers away from the city. But here the sewers do not go into the river at all, but into the Salt-water Lakes, the reclamation of which has occupied the attention of the public and Government now nearly half a century, and which could be effected if the present scheme were fully carried out. Hence on every consideration,—*viz.*, the removal of the sub-soil-water, storm-water, and house-drainage,—the improvement of the roads, the health and convenience of the public, and the reclamation of the Salt-water Lakes, I feel bound to support the drainage works.

Dr. Kenneth McLeod said:—Mr. Chairman and Gentlemen,—I have recently, for another purpose, been looking into this matter of conservancy and sewage, and I shall briefly relate to this meeting some of the results of my studies.

The question of the disposal of sewage is still undergoing lively discussion in Europe, and authorities are not at all at one as to the best method of removing the night-soil of towns. An elaborate investigation into this matter was recently ordered by the Privy Council, through its Medical Officer, Mr. Simon, who is always in the front rank cf those who endeavor to improve the sanitary condition of communities; and most likely, on his recommendation, Dr. Buchanan and Mr. V. Radcliffe were deputed to make an inquiry into the plans adopted in various towns and large institutions of England, for the removal of night-soil, with a view to find out how far existing practices might be improved and rendered more effective and less offensive and dangerous to health. These gentlemen have described in Mr. Simon's 12th Report, besides the water sewage system and its modifications, other systems,—namely, the earth system, the midden system, the tub system, the pail system, and the trough. system,—while they accord an unqualified preference to a well-ordered system of water sewage. They show that each of the others may, under certain circumstances and arrangements, be worked without much offence or risk. The great principle which they lay down is that, as little as possible must be left to the will of the individual, for they point out that the lower classes in large towns are not to be trusted in this important matter, and that arrangements must be devised under the control of a special agency, which will ensure frequent periodical removal of offensive matter, independently of the will of the individual. But the water sewage system, in its perfection, contemplates an immediate and continuous removal by mechanical agency, so that the question of water sewage, as compared with other possible plans, is one of *mechanical* agency *versus* scavenging; and however expensive or elaborate the latter may be, there is always in it the unstable element of animal agency and will, which cannot compare in efficiency, with the involuntary mechanical agency, supplied by water acting by and through a properly devised and constructed system of conduits. It will be well if Mr. Clark were to tell us something of these alternative plans as applicable to the circumstances of this country and Calcutta. A great deal has been said in discussions on this subject about the utilization of sewage. Well this matter wears a different complexion in this country. At home there is a demand for this material, and it is valuable and saleable, and its sale diminishes the cost of conservancy arrangements. Here there is no demand for, and indeed little need of, it, and the object of utilizing in the case of the Calcutta sewage is to remove offence, and to prevent the material from blocking up the outlet channel. There is also here no fear of contaminating a source of water-supply, for the water which is now liable to contamination, is not a source of water-supply. But one necessary condition of such utilization is that the material shall be applied to the land before decomposition has set in, and that, under present arrangements, cannot be accomplished in Calcutta. In England it is found that the value of sewage is diminished by over-dilution, and that sources of water-supply are contaminated. Hence the great attention bestowed on this branch of the subject. Another very valuable investigation has recently been published under the following circumstances:—Dr. Hewlett, the Medical Officer of Health for the town of Bombay, employed a recent furlough in studying the conservancy arrangements of thirty English and Scotch towns. His report on the subject has been published by the India Office, and in it we find the same unqualified testimony in favor of the water sewage system which the skilled officers employed by the Privy Council have borne. Dr. Hewlett points out, however, that the accumulation of night-soil at depôts or middensteads, previous to its disposal by water agency, is a most unsanitary and offensive arrangement. This is precisely the system which now obtains in Calcutta, and Mr. Clark should inform us what prospect there is of completing the system he has so well devised and described; what difficulties oppose it, and what arrangements are being made to secure the perfection of the system, by supplying the inhabitants of Calcutta with water-closets fitted with contrivances that will ensure, without any active interference on the part of the individual, the immediate removal of night-soil and its arrival at the outfall before decomposition has commenced, for this must be the object steadily held in view, for eventual fulfilment, as regards the whole town.

Mr. J. B. Roberts said,—I would offer my thanks to the Committee of the Social Science Association, for the courtesy which moved them to invite me to this meeting, and to you, Sir, as President, for the privilege which you have announced to admit of non-members of the Association taking part in the discussion of that most important subject to the dwellers in Calcutta, the merits or demerits of Mr. Clark's system of drainage. I am present here, not to reiterate my opinions in favor of that system, but to hear objections and adverse criticism, for the purpose of replying to them, or myself becoming a convert. I have waited for those who differ from me to rise and advance their views, but time is running on; and in the absence of the criticism I hoped to hear, the marked absence of my Native friends whom I expected would be the chief objectors to Mr. Clark's system, as applied to the northern part of Calcutta, leaves me little to say, for I will not waste time by going over the ground I have taken up so often at Municipal Meetings of the Justices. I am content, therefore, for the present to assert that, in my opinion, the natives are entitled to be heard patiently and thoughtfully as objectors to the new drainage. All I would ask of those who may produce arguments adverse to Mr. Clark's system, is to do so in a thoroughly honest, open, undiplomatic way, putting forward prominently their salient points, and not putting out of sight the real motive for objections, as diplomatists, especially of this day, are so apt to do. I for one should show no spirit of obstinacy, or desire to accept nothing the Native community could suggest. There is, however, one point on which I shall be very obstinate, wherever I have opportunity, and that will be to oppose the construction of these expensive but necessary works, unless the money is raised for them by loan on low interest, for I hold it to be a wrong, a wicked wrong, to the rate-payers, that these expensive and permanent works should be constructed out of annual revenue,—the cost must be shared by those who shall come after us.

Dr. D. B. Smith said:—Mr. Chairman and Gentlemen,—I am glad to have the opportunity of being allowed to make a few remarks on Mr. Clark's Drainage Scheme, because I feel sure that all who have paid any attention to the subject must allow that it is one of the very highest importance to the interests of the people of Calcutta. The fact which is noted by the Chairman, that Native society is in a state of agitation on this subject, goes to prove that some interest is taken in the question—how best to get rid of the impurities of this city.

Gentlemen, I have devoted a good deal of time and attention to Mr. Clark's scheme, perhaps more than most of you here present; and, therefore, I am anxious to lay my opinions before you plainly, impartially, and without any desire to exaggerate, or to be unnecessarily controversial. Mr. Clark himself has allowed, in writing, that I have "evinced an honest endeavor to ascertain the real merits of his scheme," and that I have "made it the subject of strict and unprejudiced enquiry." My opinions on this subject are easily summed up. They are already in print, and fully set forth in a Report (on "the Drainage and Conservancy of Calcutta"), which was published by the Government of Bengal about two years ago. To the opinions therein expressed, I still for the most part adhere. Briefly put, they are somewhat as follows:—(*a*) Mr. Clark's scheme is a great improvement on the old state of things; (*b*) it ought to be completed; (*c*) its chief defects seem to me the following—it would be better if solid excreta were not removed with the drainage; (*d*) the present condition of the outfall is highly unsatisfactory.

I will, if you will allow me, make a few remarks on each of these points separately:—

(*a*). Mr. Clark's scheme is a great improvement on the old state of things. If we wish to see what the old state of things was, we have only to go to the northern portions of Calcutta—for example, to the narrow streets at the back of Chitpore Road. There we see every kind of abomination, and it is scarcely too much to say that the laws of cleanliness and of health are violated at every turn. Moreover, the system of conservancy there adopted is very inefficient.

Allowing then that the northern parts of the town are very filthy, I can scarcely understand the Natives, particularly native gentlemen of education, in any way resisting reasonable propositions for its improvement.

As a *drainage* scheme (I purposely omit the question of *sewage* at present), I say, without any misgivings, that I believe Mr. Clark's project will prove very effective, and worthy of his high reputation as a well-known and eminent Engineer.

Experts of undoubted authority have approved of it as an engineering work. It would, therefore, ill become me to criticize it from this point of view. I have no wish to do so. But it is not merely a drainage scheme. It is a *sewerage* system,—*i. e.*, it takes away all the refuse of human habitations, and not only the water of drainage and of rain-fall. It is, therefore, not right to speak of Mr. Clark's scheme as one of *drainage* only. It is much more than this; it professes to be the most complete kind of sewerage. It is very important to bear this in mind. Even although the drainage project has been approved by highly competent authorities, there is no reason why it should not be discussed, from different points of view, at a meeting like the present. It is truly said that free discussion never hurts a good cause.

I particularly desire to say that any remarks I make on the present occasion, are intended simply as fair criticism of the subject before us, and not in any way as pleadings in behalf of foolish prejudice and obstructiveness.

The most important result of Mr. Clark's work will, it appears to me, be the *sub-soil drainage* of Calcutta. On this subject I wrote as follows two years ago:—

I regard this as the conspicuous merit, in a hygienic point of view, of Mr. Clark's scheme.

If it accomplished nothing but this—*the sub-soil drainage of Calcutta*—it would be worth all the money that has been or is likely to be expended on it. When this is achieved, it will be quite an era in the history of Indian sanitation.

The vast importance of sub-soil drainage is proved by the following extract from a very able Report published in 1865 by the Council of Hygiene and Public Health at New York:—

"In three of the badly drained districts noted for their insalubrity, a series of *hygrometrical observations* was kept up during the warm season. With regard to practical results from those observations, we need only state in this place, that any marked degree of excess of humidity in any locality, as compared with the standard observations at Essex market, was, without exception, found to be associated with an excessive constant sickness-rate, and particularly with infantile diseases and all kinds of contagion and infection."

Mr. Clark has very properly dwelt upon this subject at page 12 of his pamphlet (printed Address).

I now come to the third division of my subject,—Mr. Clark's scheme is not without faults. It is true that many of its defects aresuch as are inherent in all schemes of the kind, and it does not at all follow that, because we preceive certain weak points in it, we should therefore condemn it altogether. At the same time I will say that certain apprehensions, which are entertained regarding it, appear to me to be not altogether ill-founded. Objection is taken by some to the street gullies, or to the ventilation grids and smaller drains; others most fear the power and effects of the "storm-waters;" while the *cost* is what all must regard with interest and anxiety. Mr. Clark declares that he can thoroughly command the storm-waters, or at least prevent their doing much harm. He also promises to prevent all evil effects that might arise from the escape of sewer gases into dwellings. This he intends to do by gratings, and pits or traps acting on the syphon principle. I hope he may succeed in achieving all that he desires. Yet, with the medical testimony of past times before us, we cannot possibly forget that, in spite of all the science and care which is brought to bear on this subject in England, the escape of sewer gases (gases of decomposition) is by no means a thing unknown; on the contrary, that it occurs frequently, and that it is directly associated, by medical men, with the prevalence of that terrible disease—typhoid fever.

Again, Mr. Clark's scheme is still incomplete. It has not yet reached the northern parts of the town; and even in the southern parts it has been successfully completed only in some places. I mean to say that those places are as yet quite exceptional where we have house-drains and water-closets al complete and in working order; and yet this part of the work, which may be called the private portion of it, is perhaps of even greater importance than that which relates to the construction of the larger sewers. We have yet to learn from experience whether the water-closet and house-drain system in Calcutta is good and harmless. We cannot at present form a fair judgment on this point. I must say I fear it will prove not altogether so free from objection as some are inclined to believe. At present the sewers convey vast masses of filth in a state of decomposition, and they pour a flood of putrescent matter into the water-course intersecting the low, undrained land of the Salt-water Lake area.

I have thus arrived at the conclusion that the drainage scheme is a very good one, *so far as it is a mere drainage scheme, and nothing more.* It is a very great work, evincing much practical knowledge, skill, patience, and care The full engine-power is capable of lifting one million gallons per hour; and when the drains are complete, they will be upwards of 100 miles in length As far then as mere drainage goes, Mr. Clark will be, and I believe he has already proved himself to be, a great public benefactor. But I now come to what appear to me to be the two main defects of his system regarded as one of *sewerage*, and not of drainage alone: 1*stly*—The solid excreta should be excluded; 2*ndly*—The outfall arrangements are very defective. With regard to the solid fæcal matter, Mr. Clark says of his system:—"It will convey away here, as in other places, perfectly and innocuously all the solid and fluid excreta of the population." Gentlemen, I much doubt it; but I shall return to this point. I proposed to relieve Mr. Clark's scheme of the solid excreta, and so leave it, as it appears to me, an infinitely better project than it is at present (a true drainage scheme, and not a thorough sewerage one). But Mr. Clark supposed that comparisons were being instituted, which were unfair. I for one did not wish to establish any comparisons between two things which are entirely different in their nature, and therefore not to be compared; but, with others, I believed that it would be better to take the solid excretal matters away separately, and I pointed out how this could best be done. Mr. Clark says:—"If a dry conservancy system were carried out, the drainage of Calcutta would remain as absolutely an indispensable necessity to the health and well-being of the inhabitants of Calcutta as it is now." *This is perfectly true;* but some believe that the converse of this proposition is also not only true, but a matter of much importance,—*i. e.*, even although the drainage were *perfect* in every respect, the solid fæcal matter ought to be removed separately.

Mr. Clark makes out the annual cost of a dry conservancy system for Calcutta to be *twenty lakhs of rupees*, or £200,000! My calculations and estimates on the same subject will be found at p. 106 of my Report. Briefly they amount to this:—To carry out a system of dry conservancy for Calcutta (whereby 200 tons of night-soil and sweepings would daily be removed from the city) would cost something like Rs. 1,64,383 *per annum*, over and above the cost of the present Conservancy Establishment, which amounts to Rs. 1,43,066. This extra charge would render it possible greatly to increase the present Conservancy Establishment of the town; it would pay for the daily transport by rail of 200 tons of waste matter to the Piallee river, which is 18 miles from Calcutta; it would cover the rent of four square miles of land to be taken up for agricultural purposes; and it would also meet the cost of a very large establishment, numbering 500 coolies, who would remain on the ground which was to be reclaimed, and who would, without delay, mix the night-soil with earth, convert it into *poudrette* by means of pug-mills, and then dispose of it on the fields.

I calculated that the profits of such land-cultivation would, several times over, cover the cost, not only of the extra establishment entertained, but even of all the conservancy charges of Calcutta; but even if all current expenses merely were thus re-paid, without there being any profits whatever, all that is desired would be fully realized. I still believe that some such scheme comprises the best mode of getting rid of solid excreta, which, in my opinion, cannot, with safety, be allowed to pass into the drainage system of Calcutta.

I am well aware that, in connection with such conservancy problems, there are two opposite parties. In favor of the dry-earth system, the following is worthy of your attention:—

"In December 1865, the Secretary to the Government of India, in the Military Department, in his letter No. 1326, dated 30th November, to the address of the Quarter-master General, distinctly states that the Right Hon'ble the Governor General and His Excellency the Commander-in-Chief are perfectly in accord as to the superiority of 'the dry-earth system of sewage.'"

Dr. Edward Goodeve, who was for many years in Calcutta, and whose judgment is a very valuable one, as probably most of you know, has written on this subject as follows:—

"Some surprise was expressed in Europe on the absence of sewage or drains for our Indian barracks and hospitals. It would not be difficult to show that the dry system is most suited to the purpose even in England, much more is it suited to India. If to the daily removal system be added the dry-earth conservancy, which is now greatly in use in India, there can be little doubt that the problem of the best possible way of dealing with the *excreta* would be solved, and that the plan would be far preferable to that of sewers and drains."

Again, Dr. Mouat believed "in the absolute necessity of separating the sewage of Calcutta from its drainage." In a memorandum which he wrote on this subject, he expressed the following opinion:—"The result of this ill-assorted union will be disease and death in a larger measure than prevails at present, with all the abominations of the open earthen sewers of the native town."

Again, Dr. Cornish, the Sanitary Commissioner of Madras, who has devoted much attention to this subject, writes thus:—

"There is no doubt that the 'dry' system of conservancy is the best that could be devised for a country where the temperature of the air is always high.

"The evils of the sewage system in Europe are now gradually becoming apparent; and in another quarter of a century, there is no question but that the nuisance will have become so serious as to lead to a thorough change of system. The rivers flowing through towns are in many instances already so polluted, that fish will not live in them, nor can the public drink of such water with impunity." Again:—"The water-closets, house-drains, and sewers in European towns, it may be noticed, remain inoffensive during the months of spring and winter; but as the temperature of the air increases, so surely do the *cloacæ* begin to emit offensive effluvia; and the hotter the summer and autumn, the greater the nuisance from drains and running streams polluted by sewage. Whenever the temperature of water rises above 60° Faht., it ceases to absorb gases well, and becomes therefore a bad vehicle for the removal of organic matter in a state of decomposition."

It may here be mentioned that, from 350 observations made by Mr. G. A. Prinsep, the mean temperature of the surface water of the Hooghly, everywhere between Calcutta and the sea, was found to be 81° Faht.

I am aware that the Army Sanitary Commission in England recently concurred in the opinion expressed by the Justices of the Peace for the Town of Calcutta, that my proposals for removal of the night-soil of Calcutta cannot be entertained, or at least need not be discussed, on account of the great cost they would involve. I bow to the opinions of such high authorities. At the same time, gentlemen, it is worth while asking what is really being done at the present time. I will tell you. The Calcutta Suburban Municipality are daily sending down, by rail, in covered receptacles, nearly ten tons of night-soil to the Piallee bridge, at a daily cost of (I think I am right in saying) Rs. 47-13. Thus, in point of fact, that part of my scheme which entails expense (and which has just been rejected on account of its cost by the Army Sanitary Commission) is *actually adopted*, and being carried out; whilst no effort whatever is made to counter-balance this by reproductive cultivation. Ten tons of valuable manure are daily taken away at great cost,—*i. e.*, at a cost of Rs. 1,434-6 *per mensem*, or Rs. 17,214 *per annum;* and what is done with it after it has been conveyed 18 miles from the city? It is thrown into the Piallee river. It must be allowed that this is a very wasteful process, and all I will say is that such a mode of procedure is infinitely more expensive than the measures which were suggested by me—measures which have been summarily rejected at the very time when something like half a million sterling is being voted for the continuation of Mr. Clark's drainage system.

If the Salt-water Lake area is to be reclaimed in connection with the drainage system, we must remember that the estimate for this great work alone was over *seventeen lakhs of rupees.* Either this must be considered an integral part of Mr. Clark's scheme, or it must be regarded as a separate affair altogether, the object of which will, in a measure, be to rectify the evils of Mr. Clark's sewage operations at and beyond the Tengra outfall. Unless reclamation is had recourse to, the evils at the outfall must increase. Colonel Hyde, foreseeing this, has all along concurred with those who plead for regular sewage irrigation and cultivation. Failing this, he pointed out that an artificial cut might be made through the Salt-water Lake from Tengra, to a point in the Bidyaderia river, where there would be a certainty of the sewage being carried away. Self-acting sluices would be required at either end of this cut, "so as to permit only of the ingress of the time at Tengra and its egress towards the Bidyaderia. The intermittent stream (which could be well scoured by a reservoir at Tengra) so produced, uniformly flowing to the east, would, with certainty, carry away all sewage turned into it." This seems to be a proposition well worthy of consideration at the present time.

Mr. Clark writes,—"The drainage system will be a permanent work of great original cost and small annual expenditure when completed." I hope it may be so; we have no precedents in India to judge by. The drainage of the city of Glasgow (with a population, like Calcutta, of something like half a million souls) is said to produce deposits in the harbour of the Clyde, at the rate of 100,000 cubic yards yearly, and to entail an annual expenditure of £8,000 for its removal. It may be that much more thorough clearance is there required for purposes of navigation than would be necessary at the Salt-water Lake. At the same time it must be remembered that the deposit of silt must be very much greater in the case of the Calcutta drainage than it is at Glasgow. In any case, I think it not improbable that a considerable sum will annually have to be set aside under this head, even after the drainage is complete; indeed, it will necessarily be much greater after its completion than it is at present.

Mr. Clark writes of the "dry system" as follows:—

"On the subject of dry-earth conservancy, I have not one word to say in disapproval. It is suited especially to small villages in England and elsewhere, if the people could be got to think so. It is suited also for any comparatively small place where labor is cheap and well under command, such as, jails, &c.; but for a large city like Calcutta, on the score of expense alone, it is simply impossible; it is especially unsuited to the habits and feelings of the great mass of the population; and, according to my opinion, it is unnecessary."

You will perhaps agree with me that the *necessity* for the dry conservancy scheme need scarcely be discussed if it be allowed to be *impossible.* Further, I have yet to learn that there is anything in the manners of the Hindoos to warrant us in keeping waste matters away from the soil; rather perhaps are under-ground sewers and water-closets alien to their traditionary customs and modes of thought.

I now come to the outfall arrangements at Tengra. In my humble opinion, they are very defective and faulty. Mr. Clark has written as follows on this subject:—

"The high-level sewer is 8,248 feet long, and is capable of conveying about two million gallons per hour; its fall is four feet per mile; it terminates in an open excavation through the one square mile of area reclaimed from the Salt-water Lake, which is 8,900 feet long; and at its eastern extremity, distant 3¾ miles from the Circular Road, this open channel communicates with a natural stream.

"An enormous quantity of silt has accumulated in this open channel during the past two years, and by far the greater part during the last rainy season. A careful measurement shows it to be no less a quantity than 1,400,000 cubic feet, which has passed through the pumps, and necessitates the re-excavation of the channel immediately. It chiefly consists of the *débris* from the road surfaces of Calcutta, mixed with feculent matter. This large accumulation proves the power of the streams running in the sewers to transport it, and to keep them clean; they have done so to the present time in a most satisfactory manner; the result is precisely that which was intended."

To my thinking, gentlemen, the blocking up of the Tengra channel should be regarded as a *consequence* rather than as the *avowed object* of the drainage system.

I am not an advocate for magnifying the importance of undetected germs of disease. If human vision, the microscope, and chemical analysis, fail to detect impurities, they may pass. But here we have 1,400,000 cubic feet of silt mixed with feculent matter in a state of decomposition; in other words, we have a channel nearly two miles in length choked up with pestilential sludgy mud and decaying sewage refuse; at least, we had this a short time ago; it is now being cleared out. Coming events cast their shadows before them, and I have visions of other water-courses polluted and blocked up by masses of mud and feculent matter. The destruction of putrescent organic matter by oxygen in water is neither so rapid nor so perfect as some formerly believed. We must remember that our Calcutta sewers do not carry off night-soil before it has commenced to decompose; whilst the effluent waters at Tengra visibly contain fæcal matter in suspension, undissolved and unoxidized.

I am aware that Mr. Clark does not think at all so seriously of this fact as most medical men do. He writes on this subject as follows:—

"Granted, for sake of argument, that the dry conservancy is carried out for the whole city at an annual cost of *twenty lakhs*, would the drainage of the city then be accomplished? Would not the house-drainage of fluid filth, as represented in quantity by the water-supply, still have to be provided for, as also the sub-soil drainage and the storm-water? In order to show the proportionate quantities of these several fluids, I have prepared a colored diagram, the centre spot of which shows the quantity of feculent matter; the next circular area, the house-drainage; the next, what may be assumed to be the sub-soil water; and the largest circle, the daily quantity of the storm-water equal to ¼ inch per hour over the whole surface. The centre spot is, therefore, as a drop in the bucket; and when providing for the other fluids, the inclusion or exclusion of this really makes not an iota of difference."

I am well aware that there will be great dilution, yet it is quite possible that there may be danger nevertheless. The excreta of Calcutta will be mixed daily with twelve million gallons of water, so that the dilution of both liquids and solids taken together will be as 1 in 120, while the dilution of the solid excreta alone will be as 1 in 390. And Mr. Clark adds:—"If this is not high enough for safety, the limit may be attained by the employment of more pumping power." We naturally ask, what *is* the limit of safety in such a matter? The following opinions are amongst the latest from England on this subject. In a new and able work (recently received) on the "*Treatment and Utilization of Sewage*," by Dr. W. H. Corfield, Professor of Hygiene and Public Health at the University College, London, a work prepared for the Committee of the British Association, I find the following extract from the First Report of the Commission on River's Pollution:—

"We are led in each case to the inevitable conclusion that the oxidation of the organic matter in sewage proceeds with extreme slowness, even when the sewage is mixed with a large volume of unpolluted water; and that it is impossible to say how far such water must flow before the sewage matters become thoroughly oxidized. It will be safe to infer, however, from the above results, that there is no river in the United Kingdom long enough to effect the destruction of sewage by oxidation."

Again a portion of Sir Benjamin Brodie's evidence before the same Commission runs as follows:—

"I believe that an infinitesimally small quantity of decayed matter is able to produce an injurious effect upon health. Therefore, if a large proportion of organic matter was removed by the process of oxidation, the quantity left might be quite sufficient to be injurious to health. With regard to the oxidation, we know that to destroy organic matter, the most powerful oxidizing agents are required: we must boil it with nitric acid and chloric acid, and the most perfect chemical agents. To think to get rid of organic matter, by exposure to the air for a short time, is absurd."

The recommendations submitted to Her Majesty by this very important Commission were to the following intent:—

"That the casting of any solid refuse, or the discharge of any polluting liquids, such as those defined above, into any river or stream, be absolutely prohibited under adequate penalties; and that a central authority or board of not more than three persons be established with power to enforce the enactments relating to the pollution of streams, and to ascertain and cause to be removed the sources of contamination of public and domestic water-supply."

Again, in the Report of the Select Committee on the Metropolis Sewage (known as Lord Robert Montagu's), it is stated that—

"No efficient artificial method has been discovered to purify, for drinking and culinary purposes, water which has once been infected by town sewage; by no known mechanical or chemical means can such water be more than partially cleansed. It is always liable to putrefy again. Processes for filtering and deodorization cannot, therefore, be relied upon to do more than mitigate the evil. Water which appears perfectly pure to the eye is sufficient, under certain conditions, to breed serious epidemics in the population which drinks it."

I know Mr. Clark will say that this does not apply to the case of Calcutta, because the sewage is voided into streams from which the people do not drink. This is true; yet the general pollution of a river may be a matter of serious moment, in a medical point of view, even although its water is not used for drinking purposes; and I may here mention that I am informed by Mr. Galiffe, Collector of Canal Tolls, whose official duties take him a great deal to the Salt-water Lake channels and the canals on this side of them that, within the last year, vast quantities of maggots have appeared (during the hot weather) in the water-courses now referred to. This is a new thing since the sewage was voided at Tengra.

The above extracts, gentlemen, serve to show how this question of river pollution and of sewage dilution is regarded by some of the highest authorities in England. I am of opinion that we should not trust to great dilution of solid excreta with water. On this subject I expressed myself as follows two years ago:—

"It is quite true that, while a small quantity of water favors putrefaction, a large quantity diminishes the same tendency; and it is also to be allowed that minimizing an evil is good, so far as it goes. Yet indefinite dilution with water will not destroy septic poisons, and he would be an over-confident man who would assert that he could determine the point of dilution at which all danger ceases. Modern experiences tend to establish the belief that fæcal matter, although diluted to a vast degree, may be productive of the most disastrous results. The history of the 'East London Outbreak,' of cholera, the facts of which were so deeply scrutinized by Drs. Farr and Radcliffe, ought to teach us to be very careful how we pronounce in favor of water-dilution as a source of safety against fæcal poisoning. Whether the cholera in question originated from contamination of the reservoirs at Old Ford, or whether, as others believe, it was due to the storm overflows of the Metropolitan Sewage-works, everything goes to prove that danger is to be apprehended from effete organic matter in a state of decomposition, how great soever may be the quantity of water holding it in suspension. The limits of the developing power of animal poisons are altogether undetermined."

To countenance the discharging of human ordure into water-courses, no matter how great may be the quantity of water present, is to encourage the introduction of what the editor of the *Lancet* terms "the thin edge of a vicious principle." In 1861, Captain (now General) Beadle pointed out that the canal, where it forms a basin towards the city, ought to be shut off, so as to receive no polluted storm-waters. Colonel Hyde, to whose opinion much weight will always be attached in India, was from the first averse to sewage being discharged into the deep water channel of the Salt-water Lake. I do not for a moment mean to imply that Colonel Hyde is an opponent of Mr. Clark's drainage system; on the contrary, he has always strongly supported it. I merely here cite his opinion regarding the pollution of water-courses by the introduction of sewage.

As I have already shown you, Dr. Mouat was violently opposed to any such mode of disposing of night-soil. Mr. Longride, a Civil Engineer, who made a special study of the subject, was equally opposed to the voidance of sewage into the channels and creeks beyond the Tengra outfall. Dr. Chevers has, for many years, persistently warned the Municipal Commissioners against the danger, in a sanitary point of view, of voiding the sewage of Calcutta (even when diluted by storm-waters), in the direction of the Balliaghatta canal. *Lastly*, Mr. Leonard, whose judgment is known to be very cautious, careful, and valuable in such matters, has written as follows:—

"I have always said that this disposal will not do; the matter will not float away; it will be a nuisance to the canals, and I believe even to Calcutta itself." Again he writes:—"It will not do to drop it into the Salt-water Lake channel, and there allow it to float about—a nuisance to thousands. To pour into this locked-up basin the drainage of Calcutta, for a considerable part of the rains, would, I think, in a short time, render the place deadly. I am aware that the water would be entirely flood-water, and that the offensive matter contained in it would be highly diluted, so much so, that I think, if the contents thus diluted could pass away through the canals without obstruction, the admission of the flood-water from the sewers would not be seriously objectionable; but if it were received in an enormous basin, where the sewerage could settle down, and only the tolerably clean water pass off over an outlet, the foul matter would soon accumulate to such an extent that the canals would become poisonous."

You will thus see, gentlemen, that I am by no means singular in somewhat dreading the effects of the present system, in its relation to solid excretal matter. Setting metaphor aside, let us ask—What, as a matter of fact, is the quantity of sewage which Mr. Clark calls "a mere drop in the bucket?"

When the drainage system is complete, the solid excreta will probably amount to over 100 tons a day. At present, I am told, it is something like 40 tons, which may, in a sense, be hidden, but it is all there nevertheless.

In having recourse to vague figures of speech, I think Mr. Clark treats this part of his subject in an unscientific manner. Indeed, some may think that he even lays himself open to the charge of trifling with a great subject, inasmuch as his style of reasoning implies a magnificent disregard of facts and past experience of great importance. To argue on the "potentialities" of matter from mere quantity, is, I contend, not the proper way to look at this subject. By the same faulty logic we might say that, because a small-pox vehicle is very small, that therefore it cannot be productive of much harm. But what is the real truth? It is almost unnecessary to tell you, gentlemen, that, from that single speck of animal poison, a whole population might be infected. Again, a plague-spot on the human body was a small thing in itself, but it was the almost certain precursor of death. Professor Huxley tells us of chalk formations which are 1,000 feet thick, but which entirely consist of the skeletons of animalculæ, each one-hundredth of an inch in diameter. I need scarcely trouble you with similar illustrations. The question is not what a single drop or a single unit of any kind can do; but what an infinite multiple of such units may do in the course of time. The actual result of draining into European rivers and into the sea is indicated in the following passage from my Report:—

The condition of the Thames at London, the Clyde at Glasgow, the Medlock and Irwell at Manchester, the Tame at Birmingham, the Mersey at Stockport, Birkenhead, Liverpool, and Booth, the Seine at Paris, the Elbe at Hamburg, the Iser at Munich, and the Danube at Vienna, has, at one time or another, arrested public attention, from the dangerous degree of sewage-pollution that had been reached. Similarly, it has been pointed out that the harbours of Rio de Janeiro, Havannah, Brest, and Marseilles, are in the most intolerably filthy state; whilst the open sea itself at Naples, at Cadiz,—and to go nearer home—at Brighton (burdened with privy filth, the odours of which sea-breezes cannot dissipate) is foul and obnoxious.

Represent the matters figuratively as we may, the broad fact remains that hundreds of tons of noxious matter are here being disposed of on wrong principles.

This is no assumption, but a simple demonstrable fact. Experience justifies the statement that this is dangerous (as the extracts which I have read fully prove); experience further negatives the assertion that such an accumulation of feculent matter need not be thought of with any anxiety, because it is largely diluted. I think it is much to be regretted that so high an authority as Mr. Clark should publicly enunciate as true maxims which are opposed to much valuable medical testimony.

But I gladly pass to a subject on which Mr. Clark and I *entirely* agree,—I mean the reclamation of the Salt-water Lake area. Gentlemen, I feel that I have already greatly taxed your patience by speaking at such length, and I regret to find that I have not time at present to go carefully into this most important subject of reclamation. All I will say is that I am as staunch an advocate for it as any man can possibly be,—indeed, that I regard it as a great sanitary necessity in connection with the present drainage and sewerage system. Unless the land is reclaimed and utilized, the sewage must, as at present, be allowed to pass into the tidal channels and creaks of the brackish lake area, which is to be avoided by all possible means. *Forty-one years ago*, Lord William Bentinck (who had for 14 years been a Commissioner of Drainage for the Lincoln Fens) wrote a minute on this subject, urging the importance and feasibility of thoroughly draining and reclaiming the salt marsh adjoining Calcutta. He was supported in his views by very high engineering authorities; and the Court of Directors were pleased to approve of the suggestions as promising "much public benefit," and as "affording a gratifying proof of their Governor-General's desire to improve the commerce of India, and increase the salubrity of Calcutta and its vicinity." The lake, as you know, still remains unaltered and unreclaimed! This is indeed a subject which should not be allowed to rest.

I have now, gentlemen, only to apologise for having taken up so much of your time, and I beg to thank you for having given me so patient and attentive a hearing.

Baboo Peary Chand Mittra said that the only question before the Meeting was, whether Mr. Clark's system of drainage was the best Calcutta could have in an engineering and sanitary point of view. He confessed that he was not competent to express an opinion on the subject, but he did not at all blame his countrymen for not accepting the system at once, as they were not satisfied that it was unexceptional in every respect. Some of the honorable speakers, who had preceded him, had alluded to the existing system of drainage being very defective, but this nobody ever denied, and the fact of Mr. Clark's system, being in partial operation, is a conclusive proof of its condemnation. It has been asserted that the natives were "obstructive." This, Baboo Peary Chand Mittra begged to state, was not quite correct. It is well known that Dr. Mouat, at one of the Meetings of the Justices, had denounced Mr. Clark's system in the strongest of terms as being unsuited to the climate of Bengal, and instrumental in the generation of disease and pestilence. Dr. Mouat knew the country, climate, and people intimately from his long residence, and his opinion was entitled to great consideration. Was there any wonder if this strong expression of opinion unsettled the native mind? and what have they heard to-night? Of the four learned doctors who had spoken, two were in entire favor. One, as far as he could be understood, was not in entire favor, and the last (Dr. Smith) spoke in strong condemnation of an important part of the scheme. Baboo Peary Chand believed that, when Dr. Smith's remarks were published, the natives would really be "obstructive" if they had not been before, as the scheme must be *unexceptionable* in every respect, involving as it did an immense sum of money, before it could be conclusively accepted by the Natives, who are naturally anxious that the scheme should not be tried *experimentally*, nor received on *trust*.

Mr. W. Clark had listened attentively to what had fallen from previous speakers, and had been gratified to find that, with one exception, all had spoken approvingly of the scheme for draining Calcutta. Several suggestions had been made, which, in replying to his friend, Dr. David B. Smith, he should be able to notice.

Dr. Smith also had begun his remarks with much that was intended to be approved; but as he continued his long speech, his criticism had become more and more severe. He (Mr. Clark) thought Dr. Smith had said that which was calculated to mislead, and he appealed to those who had heard the remarks, whether the impression left in their minds regarding the dry earth system (or the dry conservancy system, whatever it was that Dr. Smith now advocated, for it seemed that he had changed his ground), whether that system was not capable of doing for Calcutta what the drainage was intended to do, and better than the drainage could do. In fact, he had drawn a comparison between the two systems. This is exactly what he (Mr. Clark) had to complain of in Dr. Smith's Report. He condemns the system, because the smallest possible part of its capabilities are applied to a use which he did not approve.

He absolutely condemns it, even though he takes some pains to state that, if this use of the system had not been introduced, the whole would have been worthy of the highest commendation.

In his Report he says:—" What might be done for the cleansing of Calcutta on the dry earth system with a million pounds sterling? With such a bill for water-carriage, some might think it somewhat inappropriate to boast of municipal economy." (Report, page 38.)

Page 45.—" I would here in passing again ask—" What might not have been done on the dry earth principle for a million pounds sterling, which the present system will cost before it is finished?"

Page 61.—" I shall here glance in a general way at the merits of dry-earth conservancy as compared with the hydraulic sewage system."

These were extracts from Dr. Smith's Report, from which he had himself so largely quoted. If language means anything at all, these extracts were calculated to convey the impression that there were two ways of doing the same thing, and in Dr. Smith's opinion one was far superior to the other. Hence the drainage-works, some how or other, or in some degree, seem to be wrong. This was the impression conveyed by what had just been said. He (Mr. Clark) was anxious to remove any such impression as one likely to obstruct the further progress of the improvement. Dr. Smith, in the course of his remarks, told them it was not the quantity of the matter to be dealt with, but its properties, which should be considered, and he instanced the effects which may be produced by the smallest quantity of some poisonous substances. How the comparison would apply, he (Mr. Clark) did not here propose to enquire; but Dr. Smith was entirely wrong in discarding quantity as an element for consideration. Practically, so far as the actual drainage-works are concerned, it is absolutely and entirely a question of quantity, and the provision to be made for this regulates to a great extent the cost of the whole.

To illustrate what he stated, the diagram alluded to in the paper was exhibited, showing the comparative volumes of the various matters to be conveyed away. Here the fæcal matter was represented by a small red spot one inch in diameter, while the rain-water was represented by a circular area several feet in diameter. If provision had to be made for so large a quantity of fluid, and the expense incurred, it made not one iota of the difference whether the fæcal matter was or was not admitted. Dr. Smith had just said, suppose you take the smallest quantity of small-pox virus, what disastrous effects might it not produce if introduced, &c., &c.? Now, in reply to this, he (Mr. Clark) would only say, suppose you don't take it, what then? The drainage system could only convey whatever is put into it, it had no power of selection, and he (Mr. Clark) was only an agent; it had been ruled by the authorities that the night-soil should be put into the sewers, and about 35 tons was so put into it daily. If any better means of removal could be devised, then no doubt they would keep the night-soil out of the sewers, and dispose of it on the superior plan, whatever that might be, when it is discovered; but the drainage system they must have nevertheless for other and equally important purposes, as Dr. Smith himself admits. The sewers now receive the whole of the night-soil of the town, but only a small portion of the water-supply. This is, however, only a temporary arrangement. It is an improvement on the plan of throwing the matter into the river, though it is an abuse of the system of sewers, which are designed for the purpose of removing all decomposable matter capable of being conveyed in running water before decomposition takes place, and they do remove it.

Dr. Smith also expressed his doubts about the house-drainage, which might lead to such an amount of typhoid fever as India had never known. These house-drains, he thought, had not been tried. In this, however, he was wrong. Upwards of 700 houses are connected with the system, and are in daily operation, and these houses are also entirely relieved of the night-soil by the sewers. The danger which Dr. Smith apprehended of the sewer gases entering the houses, and causing this terrible disease, is prevented by the most simple expedients, and these were explained.

Dr. McLeod has asked how the system,—*i. e.*, the storage of the filth until it is in a state of decomposition,—could be avoided.

The habits of the poorer classes of Natives are such as to render the adoption of the water-carriage system easy. The public latrines in the Southern Division, to which some thousands of persons daily resort, are now nearly all converted into water latrines, and any one can see and judge for themselves. There is an entire absence of nuisance, and the improvement is immense. From these the night-soil is discharged while it is fresh. Bustees should all be provided with similar, but small, public latrines for the use of the inhabitants.

The poorer description of the house-property when drained could be supplied with a water-closet at a cost of Rs. 30, and at any greater cost to the richer inhabitants as they might desire. He (Mr. Clark) need not, he thought, dwell any longer on Dr. Smith's first difficulty, which he said entirely referred to the non-separation of the solid excreta from the other drainage matters.

His second difficulty, he had informed them, pertained to the outfall at the Salt-water Lake. The decription they had heard of this was really terrible, and the consequences likely to ensue terrible to contemplate. He (Mr. Clark) would be glad to take every gentleman present to the Salt-water Lake, that they might judge for themselves. He felt certain, after what they had just heard, their impression would be one of great surprise. Two days ago, when he (Mr. Clark) was there, upwards of a hundred men were employed in re-excavating the channel which had been filled up, and about which so much had been said. The channel has been bunded off, and was quite dry. Even this his friend had found to be wrong, though there was literally no smell, nor was there a single case of sickness among the people employed.

It was a terrible thing when a medical gentleman threatened his less-gifted fellow-creatures with pestilence in this way; and also in connection with the house-drains, to which he had just alluded. When doing so, he really ought to fix a limit to the period within which the calamity might be expected to arise, and not establish a constant state of terror and inactivity. Happily, however, the medical profession were by no means agreed on either of these points. Many held very contrary opinions, and there yet remained good reason to hope that his friend's anxiety was groundless.

Mr. Clark by no means intended to defend the plan of discharging either drainage or sewage matters into natural streams, as Dr. Smith well knew. He had, however, stated that the reclamation of the lake and utilization of the sewage had been suggested as a remedy for the evils of the system, and that its cost, eighteen lakhs of rupees, must be added to the cost of the drainage. It is a singular circumstance certainly that the lift of the pumps at Palmer's Bridge, the levels of the high-level sewer with reference to the level of the land, in fact everything which has been done, not only since Dr. Smith's Report, but previous to it, had all been arranged, so that the utilization of the sewage, by irrigating the land, could at once be effected, and that a square mile of the lake had actually been purchased in 1865, and reclaimed for the purpose. Why it had not been so used, it was not for him to say; he really did not know; as an agent he could only do that which he was permitted to do; and if the sewage was not up to this day utilized on the land, it was no fault of his. In performance of his duties, he had urged it in 1868, but his suggestion was not attended to. There can be no doubt whatever that the untilization will prove highly profitable, as his friend well knew. There was therefore no necessity for including its cost in that of the drainage-works; that would be simply to magnify difficulties. The omission of this very necessary improvement, up to the present time, must be explained by others: all he knew was that the means of doing it were at hand, and it ought to be done. Here happily he and Dr. Smith agreed most cordially, but he nevertheless considered it wrong in his friend to proclaim all sorts of defects consequent on the present incomplete state of things, as permanent defects in the scheme when complete.

Dr. Smith had alluded to the fact that the Suburban Municipality are now actually carrying out what he had suggested in his report,—*i. e.*, they are, at a cost of Rs. 1,434 per mensem, sending the night-soil by rail to the *Piallee* river. True, but they are throwing it into the river; and it was chiefly with reference to the pollution of natural streams that his friend had addressed them at such considerable length. On this point, however, as it is admitted even by Dr. Smith himself that the drainage-works of Calcutta are so arranged as not to pollute any water-course which is or may be used as a source of domestic supply, he did not think it necessary to follow him.

Dr. Smith, it seems, now recommends what is called the dry conservancy system,—that is, the collection of the night-soil, and its removal to a distant spot for agricultural purposes, a little carbolic acid being put on the top to prevent nuisance. Is Dr. Smith aware that, the carbolic acid excepted, the plan has actually been tried in Calcutta, and on a large scale, in 1865-66?

Two road traction engines were purchased, all necessary trucks were built, inodorous tubs were made, land purchased, tramways laid down, excavations made, and the filth actually put into them, and covered up with earth. It is a fact that this was all done, and nothing was left undone to make it a success. Between Rs. 60,000 and 70,000 were expended on the attempt thus to dispose of the solid excreta of Calcutta; but the matter proved so intractable, that it would not remain buried; it insisted on coming to the surface, and finally the plan had to be abandoned. These are facts which it is well to consider. If the dry *earth* system might succeed, it is quite certain that this case of dry *conservancy* did not. The carbolic acid certainly was not used. This was probably owing to the opinion of the Health Officer, who has recently stated that it is useless when applied to such matter, and only acts by substituting one smell for another.

There is still one other point on which Dr. Smith has doubts of the drainage system,—*viz.*, the expenses which may be entailed in the removal of deposits, &c. He mentioned the Clyde at Glasgow, a city about the size of Calcutta. There all the sewage of the town is thrown into the river, from which the deposit has to be dredged at an annual cost of £8,000. He also mentioned the cost of the re-excavation of the channel in the lake which is now going on. Mr. Clark would not stop to enquire whether the £8,000 did not cover other expenses than that of removing the deposit caused by the sewers at Glasgow. Even if it were so, the two cases are not alike. At Glasgow it is a process of dredging the river, a totally different thing from the excavation of a shallow channel, which can be laid dry for the purpose. It is probable that this expense may amount to Rs. 7,000 per annum for Calcutta; but it is undoubtedly matter containing some considerable manurial value, and will find its use on the spot, when the square mile of reclaimed area is brought under cultivation. Moreover, it is this identical matter which has annually to be excavated and carted away from the filthy open drains and ditches of Calcutta at present, and at a cost undoubtedly much greater than it can be done at the Salt-water Lake.

Dr. Smith has told you of the maggots which have made their appearance in the lake channels, where they had not been known before; and he objects to the passage in my paper where he (Mr. Clark) refers to the large amount of deposit which has passed through the pumps. The passage objected to was this:—"This large accumulation proves the power of the streams running in the sewers to keep them clean; they have done so to the present time in a most satisfactory manner; the result is precisely that which was intended." Now this is absolutely true, and it seemed to him (Mr. Clark) that the maggots prove the very facts which are adduced in the above extract.

The maggots are not produced in the sewers; they are put into them at the filth depôts, and find their way through the pumps to the Salt-water Lake within a period of three or four hours afterwards. Many native residences are not cleared of this filth for months at a time, and it is then a mass of maggots. This is their origin, and their presence in the Salt-water Lake channel is an additional proof of what was stated in the paper. If Mr. Clark had said anything, he should not have said, he trusted that he might be forgiven; the subject is one in which he is deeply interested, and apt to speak strongly when any statements are made likely to mislead those who do not understand it, or are in any way calculated to cause obstruction to the progress of the improvement, as in the present instance he feared might be, had he not trespassed somewhat on their time to make his reply. However, it was nevertheless a fact that his friend and himself agreed upon much, and differed only in a comparatively small matter.

ECONOMY AND TRADE.

1.—*Decentralization of the Finances of India:* *By* R. KNIGHT, F.S.S.

(*A Review of the Government Resolution of* 14*th December* 1870.)

[Read on the 22nd April 1871.]

THAT the scheme for decentralizing the Finances of the country, embodied in the late Resolution of the Viceroy and Governor-General in Council, is the commencement of a great and weighty reform, I think we need entertain no doubt whatever. I believe it was loyally and honestly conceived, and that, while imperfect and tentative only, it marks the inauguration of a new system altogether, concerning the nature, necessity, and effects of which your President has done me the honor to request that I would state to you my views. The Resolution, I observe, defines the *object* of the Governor-General in Council in issuing it, and expresses at the same time a *desire* and a *hope.* The object, we are assured, is " the instruction of many peoples ' and races in a good system of administration, as the scheme ' will afford opportunities for the development of self-govern- ' ment, for the strengthening municipal institutions, local ' interest, supervision, and care necessary in the management of funds devoted to education, sanitation, medical charity, " and local public works." This is the avowed *object* of the scheme—to afford opportunities for the development of self-government in the empire. The Resolution proceeds to tell us that the scheme has been conceived in the *desire* " to confine ' the interference of the Supreme Government in the adminis- ' tration of the Provincial Services to what is necessary for ' the discharge of that responsibility which the Viceroy in ' Council owes to the Queen and her responsible advisers ; and ' to what is necessary for the purpose of securing adherence (1) ' to the financial conditions now prescribed, and (2) to the " general policy of the Government of India" (para. 25). The *hope* it expresses is that " the Resolution will be received in " the spirit in which it is promulgated, and that it will lead to "more harmony in action and feeling between the Supreme "and the Provincial Governments than has heretofore pre-"vailed."

It is to be regretted, I think, that any exposition of the Resolution after this was ventured upon in the Legislative Council, for the scheme has suffered by the interpretations put upon it by more than one member of the Supreme Executive. I believe there was a general disposition on the part of official men in the provinces to welcome the Resolution in "the spirit "in which it was promulgated." The Honorable Mr. Arbuthnot gave expression in the Madras Council to this feeling when he said,—"I entertain a strong conviction that the measure is "a real advance in the path of administrative and financial "reform, which there is every reason to hope will lead to fur-"ther measures in the same direction, and which will confer "great advantages on the country." The Honorable Mr. Norton, on the same occasion, said,—"it is because I regard it as "the point of the wedge that I hail the recent order. I believe "that it contains in it the seed and germs of what in due sea-"son will ripen into the best and richest fruits." You know, however, that two interpretations have been put upon the Resolution, and that *non*-official men generally and the press have shown much distrust of the whole scheme, and an unwillingness to believe that it is inspired by anything but pure selfishness. A non-official member of the Madras Council (the Honorable Mr. Macfadyen) seems to have given expression to this feeling on the same occasion, in the following terms:—"Stripped of use-"less verbiage, what the Government of India says is simply:—"Here are a number of objects, the annual expenditure upon "which must, from the nature of things, go on increasing; "we cannot be bothered finding funds for them any longer; "we will compromise with you. There, Madras, take 9 lakhs, "and go to local taxes for anything more you require. The "great point is, however, don't worry us; we wash our hands "of you, and we hold you responsible if anything goes wrong; "so now be happy."

Had the Resolution stood alone, this unfortunate impression would, I think, have died away, but it is impossible to conceal that in the course of the late debates in Council, the most curious care was taken to discredit the motives of the scheme, and to invest it with that purely selfish aspect which the popular distrust assigns to it. Certainly the tone of some of those speeches was altogether discordant with that of the Resolution. Well, but most ungraciously, did one speaker say that "whatever might "become of the hopes cherished from the scheme as to the "people's advantage, sure he was with certainty free from shade "of doubt that the measure was advantageous to the Imperial "Budget."

An avowal was ostentatiously made by the same speaker that the Government had determined to appropriate every source of *expanding* revenue as its own, while throwing every *expanding* head of charge upon the local Executives; while he at the same time admitted that, "as regards new taxation, great caution would "have to be exercised by them." "The local Governments are "to have a fixed annual allotment for those branches of civil "expenditure in which, from the progressive spirit of the age, "the demands for increased outlay most arise. If the allotments "suffice, then that is well; if they do not suffice, then the local "Governments are not to apply to the Government of India for "increased aid." In another of these unfortunate speeches, it was pointed out that "the Supreme Government could now say "positively that its aggregate expenditure under certain heads "[those which most tend to expand] would not increase. Thus, "it has obtained a real power of control in place of that vexa- "tious meddling with details by which it used to contrive to "disgust every local Government in India. The charges for "these branches of the civil administration have, during the last "ten years, been increasing at an enormous rate, and it was "certain that this process would go on. Every branch of the "public revenue, without exception, has been in a most flourish- "ing condition, but all the advantage has been swallowed up by "the endless demands for increased expenditure. In regard to "at least a portion of our charges, a limit has now been put upon "this constant growth of expenditure."

It is very much to be regretted, I think, that these comments were ever made. They are discordant with the tone of the Resolution, and resolve it into an expression of pure selfishness, which, I am persuaded, it is not. Speech may be silver; silence is golden. The strange want of reticence shown in the debates has thrown discredit upon a Resolution which I prefer still to believe is an honest effort towards the attainment of a great reform. In spite, then, of these unfortunate speeches, I think it wiser still to regard the Resolution as an honest and unselfish attempt on the part of the Supreme Government to introduce a great reform into our finance, by divesting itself of a part of those powers and responsibilities hitherto unwisely engrossed by it.

I refuse to believe that the State was moved thereto by a mere wish to cast upon the local Governments the burden of every expanding head of charge. I prefer to believe that it was adopted in the conviction that the attempt to administer the affairs of a dozen different nations in this city is a mistake ; that whatever relief the Resolution may bring to the Finance Minister is but a happy accident ; and that the *object*, the *desire*, and the *hope* of the Governor-General in Council in issuing it are loyally and truthfully declared in the Resolution itself ; and I venture to say further that I believe we owe its adoption largely to the Viceroy himself personally.

DIFFERENT SCHEMES.

You are no doubt aware that several plans for effecting this reform have been put forward. The germ of the Government scheme seems to have been planted in the official mind nine years ago by Mr. Laing, who, in the course of his Financial Statement in 1862, pointed out the necessity of some such step. "The great branches of the expenditure," said Mr. Laing, "such as the army and national debt, are imperial, and while "this is the case, the great branches of revenue must remain "imperial also. But there is a wide field, both of revenue and "expenditure, which is properly local, which in England is met "by local rates, and which in fact must be met locally or not at "all." The subject was discussed at length in the Supreme Council in 1867, at the instance, I believe, of Mr. Massey, but the appers have never been made public. The real author of the present scheme seems to be the Honb'le Mr. Strachey, whose minute of 28th January 1868 (when he was Commissioner of Oudh), is substantially the Resolution as it now stands. Mr. Strachey's view is "that it is quite impossible for the local Governments or "for the central authority to say what portion of the revenues "raised under them is properly applicable to local wants. These "revenues go into a common fund, and to determine how much "of this fund ought to be given to one province, and how much "to another, is under the present system impossible." "We "require," says Mr. Strachey, "greater, not less, control of the "finances. * * * The proposed new plan, instead of an annual "review, makes once for all a final limitation of the aggregate "of certain grants, and the internal distribution would be left to "local discretion." Substantially, this is the plan adopted, and were it to be regarded as a final settlement of the question, it would be fatally defective. The statement that it is impossible to say what portion of the revenue is properly applicable to local wants is a *petitio principii,* while the resolution to retain every existing branch of revenue, and at the same time put a final limitation upon the grants for every expanding head of charge, is more like the counsel of men who are desperate than of statesmen. I divined very early what the real character of this decentralization was, and warned the press of it eighteen months ago, at a time when they were congratulating themselves upon what they supposed to be Mr. Strachey's accession to their ranks. The Resolution is what I foresaw would be attempted, and I say it is fatally defective. It seems, however, to be in great favor in this city, as two of your leading journals give it full support. The *Friend of India* would have you believe that the plan of making grants from the Imperial Treasury is essential to the unity of the Empire; but how the unity of the Empire would be destroyed by federalizing its finances, I am unable to discern. The writer is frightened by a word. The only adequate reform open to us is a federalized system of finance. Another of your journals (the *Observer*) I am sorry to see adopting a tone which I hoped had been banished from the press. Full of the spirit of that bureaucracy which has so long tyrannized over the provinces, this journal tells you that "the only financial measures "with which local Councils are qualified to deal, are bills pro-"viding machinery for what really is local taxation,—that is to say, "measures enabling municipalities and other commercial bodies "to raise funds to be spent under their own supervision." You will permit me to say that writing of this order is very unwise. How can the Madras Council, for instance, which is full of very able men, or the Bombay Council, with its experienced Chief, and the communities of those two cities, regard such writing as other than insolent? Upon the whole, it would seem that the decentralization scheme of the Resolution may be described as the scheme of the "Bengal Civilian" party. It does not command the assent of your non-official community, while the leading native journal of your city (the *Hindoo Patriot*) expresses views far in advance of those in which the Government scheme is conceived. "Our plan of decentralization," says the *Patriot,* "is this,—we "would separate all the imperial charges from the local budgets, "and exact a percentage as a sort of tribute from the local "Governments for the defrayal of imperial expenditure. This "percentage the local Governments should be required to make "a first charge upon their respective revenues * * *, and any "surplus should be applied to its own benefit."

Substantially, this is what may be called the Madras plan. "My view," says the Honorable Mr. Arbuthnot, "is that, instead "of determining what sum each province is to be at liberty "to expend in the provincial administration, the Supreme "Government should determine what sum each province should "contribute for imperial purposes, and should leave to it the "remainder, whatever it may be, for provincial purposes. I "cannot but regard a reform which deals only with the expendi-"ture side of the account, as to a certain extent an incomplete "reform." In accordance with these views, are those of the Honorable Mr. Macfadyen. "The day of true decentraliza-"tion," he says, "will be when the Imperial Government shall "say to the Local Government, your contribution to imperial "objects is so much—pay it; use the rest of your income as "your local wisdom dictates." Mr. Norton's plan seems to be the same:—"A scheme in which imperial charges should be "accurately defined, under which the contribution which each "presidency should make to imperial revenues to carry out "and maintain all imperial objects which concern the whole "Empire, such as the Army, Post Office, Guranteed Interest, and "the like, should from time to time be fixed by the Supreme "Government, and that after the deduction, each presidency "should have the entire management and expenditure of all the "rest of its revenues,—subject, of course, to the final control of "the Supreme Government. * * * Instead of saying, 'I will "'give you so much. and take all the rest,' the language of a "sound decentralization should be, 'give me so much, and keep "'all the rest.'" This plan is an immense advance upon that of the Resolution, and seems to express the views of the non-official community of India generally. The Bombay journals have expressed much dissatisfaction with the Resolution, but put forward no scheme of their own, although some of them seem to be convinced that the suggestion made by the *Indian Economist* eighteen months ago is the right one. I do not think, then, that the Imperial Treasury should, as Madras proposes, be made dependent upon a system of grants or contributions from the local Government. The Imperial Government has the *right* to levy such taxes upon the country as may be necessary for the imperial expenditure. It cannot divest itself of that right. I would subject this taxation to but one condition—that it should be uniform throughout the country. The Supreme Government has the right, I say—the indefeasible right—to impose whatever taxes may be necessary for its expenditure; and I know of one condition only by which that right is limited,—namely, that the taxes must be uniform throughout the country. I have repeatedly pointed out that we have a model of the purest form for our guidance in the American system, which has worked so successfully.

By the constitution of the United States, Congress has power—

I.—To lay and collect taxes, duties, imposts, and excises; to pay the debts, and provide for the common defence and general welfare of the United States; *but all duties, imposts, and excises shall be uniform throughout the United States.*

We have here a simple but comprehensive and exact statement of the purposes for which the Imperial Government exists at Washington, and our own here at Calcutta:—(1st) to pay the debts; and (2nd) to provide for the common defence and general (as opposed to *local*) welfare of the States. The purposes for which the Imperial Government exists being the common defence and general welfare, it follows, as a just requirement, that the taxes levied for the attainment of these purposes shall be *uniform throughout the country.* This great but simple principle should be adopted in India. Taxes that are equal in their pressure throughout the Empire are marked out by *that very fact* as imperial in their nature, and should be treated as such. Such are the import and export duties of the country; and such are, or should be, the excise duties upon opium, salt, abkaree, &c. We may federalize or decentralize our finances upon the American model I believe with ease, and with nothing but advantage to the country.

The Government Resolution plainly confounds together two distinct things,—provincial with municipal taxation. In an empire consisting of several nations, the system of taxation will naturally divide itself into three great branches. There will be (1) *Imperial* taxation for the purpose of the common defence and welfare, the equitable condition of which is that it shall be uniform throughout the empire. In the second place, there will be (2) *Provincial* taxation for purposes of local civil administration, which taxation, instead of being uniform, will be adapted in each part of the empire to the peculiar circumstances of the people. And (3) there will be the *Municipal*, or local, taxation proper to each city and township and rural district of the provinces. The municipal taxation of a city like Bombay will necessarily differ from that of a mofussil city like Poona, or a purely agricultural town like Dharwar. The provincial taxation for the civil administration of the presidency will differ again from both; while the imperial taxation will have no necessary connection with either. And the sooner the Imperial Government devolves upon the provinces, and the provinces upon the municipalities, their just and proper responsibilities, the sooner shall we see that self-government—desiderated by the Resolution—become a fact. The Resolution helps forward this reform in the faintest possible way, but is very valuable as an initial movement in the right direction.

PRELIMINARY STEPS.

In bringing about the reform that is really needed, the preliminary steps to be taken are to my mind very clear. What, in the first place, is that imperial expenditure of which we hear so much? In general terms, it is so much of the expenditure of the Supreme Government and of Her Majesty's Secretary of State, as is incurred for the common defence and general welfare of the empire. One of the first steps therefore towards a just decentralization would plainly be an examination of the accounts of the last ten years, to ascertain exactly what the expenditure upon these purposes has been. I indicate it roughly when I say that it comprises the interest upon the National Debt, the cost of our Military and Marine Establishments, Political Agencies, Public Works of an Imperial nature, such as our Telegraphs and great lines of Railway, the Post Office, and the Establishments of the Governor-General and of Her Majesty's Secretary of State. I believe it would be found that the strictly imperial charges amount to about £25,000,000 sterling a year. We ought not, however, to be left to impressions upon a subject so important. It would be perfectly easy by an analysis of the accounts to show exactly what the imperial expenditure really is, and that expenditure on the one hand, with the imperial revenues on the other, should form the imperial budget, the only budget dealt with by the imperial Government. As to the imperial revenues, the principle which clearly and sufficiently distinguishes them from local imposts, is the fact that they arise either (1) from the common property of the empire, or (2) from taxes that fall with uniform weight upon the provinces.

Thus, opium is plainly an imperial revenue, because it is the imperial command of the whole seaboard of India that makes the export duty possible. Customs duties again are imperial, because they fall with uniform weight upon us all; stamps the same; salt is very nearly the same, and should be altogether so. Now, if these revenues were not sufficient to meet the imperial expenditure, and no eligible tax of uniform weight presented itself to the Supreme Council, what could be simpler than the apportionment of the deficit, whatever it was, rateably amongst the provinces? In the nature of things, the imperial Government cannot divest itself of the right to "levy taxes," or "contributions," upon the country for the purposes of the Imperial expenditure; and it is a mere question of detail whether it would be better for the Supreme Government to tax the provinces directly by additional imposts of uniform weight, for any deficit there might be, or mediately by assessing them rateably in a lump sum to the State requirements, leaving it to each local Government to decide the special taxation by which the contribution should be raised.

The *first* step towards effectual reform is, I say, the preparation of a strictly imperial balance-sheet for every year of the last decade, showing what the expenditure upon imperial account has been, and what the strictly imperial receipts. The *second* step would be the resolution of the accounts for the same period into a series of local balance-sheets, that we might know with certainty what each province has contributed during the decade to the Treasury. There would be no difficulty whatever in laying before the world an honest exposition of the state of matters. The Government Resolution is avowedly empirical in its treatment of the subject, and disclaims all *principle* in its allotments. We can therefore only look upon it as a rough attempt to make a beginning, and as such welcome it. If the work is to be done satisfactorily, we must begin by a resolution of the accounts into the imperial and local balance-sheets of which they consist. The local budgets as at present prepared are simply a snare and delusion. Thus, Bengal takes credit in *its* account for the export duty upon opium as though it were a contribution made by Bengal to the Treasury; on the other side, it is charged with the cost of the drug. The receipt and the charge are alike imperial, while, by being included in the local budget, they completely destroy its character, and deprive it of all value. Instead of serving any good purpose, these budgets, as now prepared, simply propagate delusions, and promote jealousy and strife. In the absence of exact enquiry of the nature I demand, a Bombay paper (*Times of India*) recently affirmed that "the population of Bombay contributes to the "imperial revenue *pro rata* nearly three times, and Madras "twice the amount paid per head by the people of Bengal." I have given much attention to this subject, and my own conviction is that an analysis of the accounts would show that the burden of the imperial expenditure is at present borne almost wholly by Madras, the North-West Provinces, and Oudh; and I have striven to conduct my enquiries with the strictest impartiality. The accounts of most of the provinces are very simple, and so far as I can make out, the Central Provinces contribute *nothing* to the Imperial Treasury, but make a heavy draft thereon year by year; Bengal almost nothing, when we bear in mind its resources and its population; and the Punjab a very small amount in comparison with what it ought to pay; while Madras, the North-West Provinces, and Oudh, between them, keep the Empire solvent. The Bombay accounts require more leisure than I have been able to give them; but I doubt whether they will be found to bear out the statements made by the Bombay journals. Owing to the exceptionally high cost of its establishments, the revenues of the presidency are more largely absorbed by local demands than its publicists suppose. I myself shared their belief for some time, but I think it is an error. The Burmah account is also exceptional, owing to the capitation tax levied therein, and the heavy export duty upon its staple trade. There would be no real difficulty, however, in dealing with either of these accounts. What I want to impress upon you is the fact that the local balance-sheets as at present prepared simply propagate delusion and error; and that the first step towards just and honest decentralization, and an equitable adjustment of the imperial burden between the provinces, is the resolution of the accounts of the last ten years into a series of imperial and local balance-sheets, when the amount contributed by each province would be authoritatively declared. I cannot but think that there is some dishonesty in the perpetuation of the present system. There is a misgiving, I greatly fear, that Bengal would not show well in the series; and it is certain that it will not. But what then? The just thing is the strong thing, and it alone. Every unjust thing in this world must take the fate that God has appointed it; and what sort of Government is that which deliberately sets itself to maintain the *unjust* thing until the public indignation becomes too strong for it!

RESPONSE OF THE PROVINCES.

The loyalty with which the Resolution has been responded to is, I think, very striking. Hardly was the scheme promulgated than the three most heavily-weighted provinces of the Empire stated their willingness to bear the new burdens devolved upon them. I am not sure that this honorable readiness on the part of Madras, the North-West Provinces, and Oudh is not a mistake. At all events, I am satisfied that were a re-adjustment of the State burdens fairly made, these provinces, instead of having to impose fresh taxes upon their people, would find their treasuries overflowing with means for local works of improvement, and for education. Some may think it imprudent to speak thus; I do not think so. Let us know once for all that it is the *just* thing alone that is the really strong thing in this world—the thing that can endure. I honor the Governments of Madras, and of Oudh, and of the North-West for their loyalty in promptly devising cesses and license fees to supplement the grants assigned to them by the Resolution; but it might have been better for us all had they shown less readiness to do so, and a somewhat marked resolution to have the question of their just and proper liability to the imperial Exchequer ascertained beforehand. Had they refused to impose new taxes upon their territories, not in a spirit of contumacy, but of just resistance to what is wrong, they might have forced a consideration of the *principle* involved in the Resolution upon the Government. I am convinced that these new cesses in Madras, Oudh, and the North-West are in every case wrong and unjust, because these territories under the present system are already being made to pay into the Imperial Treasury vast sums of money that ought not to go beyond the local one. Even if I am altogether wrong, whose fault is it? I have striven to be right, and it is the fault of the State that there is any uncertainty in the matter. With Bombay the issue is more doubtful, and its balance-sheet would require more careful treatment than I could possibly give it in this paper.

In the case of these Lower Provinces, however, I have no doubt whatever. The delusion of the native journals of this city, that Bengal is "the milch-cow of the empire," is profound. It is here, if anywhere, that special local taxation is an absolute necessity; here, where of all other places a demand is set up for immunity from all taxes whatever. In coming to a consideration of the cesses proposed to be levied here, I have a remark or two to make upon the subject of the Cornwallis Settlement which the zemindars are accustomed to plead in bar of their liability to taxation. I have no doubt whatever of the honesty, the good faith, with which the plea is put forward. When we remember that the construction which they put upon the settlement is upheld by statesmen of eminence, and by great legal authorities, it is impossible to question the good faith of these gentlemen, or to blame them for the persistence or the passion with which they urge their case; and yet I have no more doubt of their error than of my existence, because I see clearly its sources and foundation. I have earnestly therefore to solicit the attention of the zemindars present, to a consideration which, when once clearly understood, cuts up by the roots every argument put forward in defence of their claim. I have never yet seen, then, an argument in its defence that did not rest upon a total misconception of the *nature* of the settlement. I appeal to the zemindars present, whether I do not describe the settlement correctly when I say that on the part of the State it was a *sale* of certain property of which the State was owner, and on the part of the zemindar a *purchase* of that property; the price being a perpetual annuity secured by a first lien on the property. Is this, or is it not, a true description of the transaction? Now the error which underlies every argument in defence of the claim to immunity from taxation arises from forgetfulness of this fact. The zemindar and all his authorities fall into one and the same mistake. The settlement, instead of being a mere sale and purchase of certain State *property*, is supposed by them to have been a commutation for all time of the State claim for *taxes*. The consideration, in their eyes, for this perpetual annuity, was perpetual immunity from taxation. On the other hand, I affirm that it is as clear as the sun at noonday that the consideration for the annuity was the State rights in the land. The perpetual annuity is the price which the zemindar agreed to pay for the transfer to himself of the State property in the soil. It is not necessary to determine what the exact nature of the property was that was sold and transferred; it is simply necessary to fasten your attention upon the fact that this was the true nature of the transaction. I doubt if there is any zemindar in this room who will venture to deny the accuracy of this account of the distinctive nature of the settlement. It was a sale and purchase of a certain property.*

---

* It is at the same time a matter of great importance that the exact nature of the property should be ascertained. It is a reproach to the Supreme Government that it was not long since ascertained beyond doubt. My own conviction is that the State sold to the zemindar simply the *khirauj* upon the soil. It will be allowed that Lord Cornwallis *could* not sell to the zemindar more than belonged to the State, and an authoritative declaration ought long since to have been made of the nature, exent, and limits of the property which the State sold, and which the zemindar bought, and now enjoys.

The perpetual annuity paid by the zemindars is not paid in commutation of their liability to taxes, but is the stipulated price they pay for the transfer to themselves of the State property in the soil. The distinction is vital; the zemindar claims to be the landlord of Bengal. Well, nothing is more certain than that he was not so a hundred years ago. When and how, then, did he acquire the landlord right? You know the answer as well as I do. You bought the landlordship, or all that the State *could* sell of it, in 1793; and the price you gave for it was that perpetual annuity you are now paying. But because the *rental* was commuted with you for all time, and because by a mere accident that rental happened to stand the State in the room of *taxes*, you think that you bought not merely the rental which we allow, but an immunity from *taxes* which we say is preposterous. If it be so, you are entitled not only to exemption from the income tax, but it is a violation of the settlement to subject your class to the salt duty, or to customs duty, stamp duty, or any other impost whatever. You have the right to claim that your goods should pass through the Custom House free, that your salt should pay no excise, and your legal acts no fees; that the rental which you bought happened to serve the State in the room of *taxes*, has invested the settlement in your eyes with the aspect of a commutation of the right to *tax* you. The more extensive and absolute the rights which you claim in the soil, the more manifest does the nature of the transaction become. The settlement made you the owners of a property which belonged neither to you nor to your fathers, but to the State; and the price you paid for it is that perpetual annuity which you so strangely regard as a price paid for perpetual immunity from taxation. What, then, did you pay for the land? To establish your claim, you must show that the annuity which you are paying is the price of two distinct purchases contemplated and made: (1) Those landlord rights which you declare to be so absolute, and which with greater or less modification we allow; and (2) a perpetual exemption from all taxes.

Stated in this naked form, you must yourselves see the absurdity of the claim. Suppose, for a moment that the settlement really was designed to give you this immunity, you will allow that it is a matter of plain obligation to put you to the proof of the fact. Well, the law courts are open to you, with a final appeal to the Privy Council. Why, then, do you not sue the Government for recovery of the income tax, the salt duties, the customs duties, the stamp fees, which it is wringing from you in violation of your immunity? If *your* account of the settlement be the true one, it will be within the four corners of the bond, and you cannot yourselves hold that, in a matter of such importance, the mere inferences which you draw from doubtful expressions in the Regulations would justify the Government in countenancing the claim which you advance. Your claim is bad in law, gentlemen, and bad in equity, and, however honestly put forward, proceeds upon a plain misconception of what the settlement really was. It was a mere sale and purchase of property. Not one rupee of that annuity which you are paying is taxation. Your error is that you think you are paying a heavy *tax* every year; and your friends all make the same mistake. They one and all look upon the four millions a year of the annuity as your contribution to the *taxes*. There is not one rupee of *taxes* in that payment, and never was. Lord Cornwallis unwisely sold to you a property, which is to-day yielding you £20,000,000 a year, while the stipulated annuity which you are paying out of the £20,000,000 you persuade yourselves is your contribution to the taxes. Because it is a contribution to the *Treasury*, you think it is a contribution to the *taxes*. Not one sixpence of it is a contribution to *taxes*. It represents simply State property, *my* property just as much as yours, and it is as much a contribution made by *me* to the taxes as by *you*. Some of you of late years have begun to get an inkling of this fact, some insight into it, and simply claim that no *special* tax shall be laid upon you. You are willing to pay taxes in common with others, but you object to being singled out as specially liable thereto; and yet nothing is more certain than that equity, and reason and sound economy, all declare you to be liable to *special* taxation. You know as well as I do that of late years the conviction of all men who make political subjects their study has tended towards the conclusion that the *land everywhere* is the first and most proper source of the public revenue. Now your peculiar position is this—that you owe your wealth to a comparatively recent Act of the Legislature, and that you have been made wealthy at the expense of the Commonwealth. The well-meaning and benevolent act of Lord Cornwallis is now held by almost every student to have been a profound economic error to which the innumerable evils that now afflict these provinces are directly traceable; but that error made your fortunes. Now, if it be a scientific truth that the *land everywhere* is the first and most legitimate subject of taxation—even in countries where it has been private property for a thousand years—what, I ask, must it be in your case? For you are not a body of ancient freeholders around whose property a prescriptive hedge has grown, venerable for its age, and rooted in the regard and prejudices of the people; you are but of yesterday. Many of you bought your rights at auction but a few years back; and it is *you* of all other land-owning classes who set up these pretensions—pretensions unheard of in any part of the world but here. I am bound to avow my conviction in your presence that there is no class of men in the world so justly obnoxious to special taxation, *considering all the circumstances of the case*, as the land-owning classes of these provinces. It would be an injustice to myself, and not complimentary to you, to apologize for this emphatic statement of my convictions. I have not the slightest prejudice against the zemindar, but I have an overwhelming sense of the evils which have sprung from the creation of the class, and I protest with my whole might against the attempt in these provinces to invest it with rights founded neither in the settlement itself, nor in equity, nor, allow me to add, in common sense. The proposal to levy a cess upon you for education and for roads is founded in justice, and must be upheld. I observe that one of your local newspapers advises the British Indian Association that they should narrow their petition to Parliament against the cess to one issue, and to that alone,—namely, “whether the “terms of the permanent settlement admit of the imposition of an “additional tax on the perpetually settled estates, either for local “or imperial purposes? ‘All other questions,’ says the writer, “‘which involve the consideration of the policy of the permanent “‘settlement, and its merits as an economic, social, and political “‘measure, and its practical working, are quite beside the pur-“‘pose.’”

But what need is there of petitioning Parliament at all? Why does not one of your body, who has been required to pay the income tax, sue Government for the amount in the High Court? If the tax violates in any way the Regulations of 1793, you have only to prove the fact to the satisfaction of the Court, to recover a verdict against the State. Parliament will not look at your petition while you neglect the constitutional means of redress provided for you in the courts of law. The answer, the only possible answer, of Parliament to your petition will be,—“you complain that the law is being “violated by the State, which proceeds, you say, on an erro-“neous interpretation of the settlement. But Her Majesty's “judges are the authority to whom it belongs to interpret the "law. Go to them! Parliament can *make* laws, but to the "judges only does it belong to say what they mean." If you want the settlement *changed*, then you may properly appeal to Parliament; if you merely want it to be interpreted authoritatively, then you must go to the law courts. Parliament cannot help you; it can annul the perpetual settlement, and decree a new one in its room; but Parliament cannot *interpret* the Cornwallis settlement, even were it disposed to do so. I appeal to the zemindars present, some of whom are, I believe, lawyers, to say whether I am not right in this advice. How preposterous is it to be ever airing a grievance in public, with sentimental and passionate exclamations that you are wronged, when the constitution supplies you with a power of compelling the State to withdraw its hand, if that hand is really oppressing you! What can be more absurd than the piling up a heap of minutes, a whole mountain of controversy, as to the meaning of a certain law, when the judges are its authorized interpreters. All the minutes of the Council in Calcutta, and of the members of that Council of *Ancients* at home, do not help you in the least; they are mere expressions of opinion. The judges will declare the law if you ask them; and when the highest court of appeal has spoken, the judgment is final, and must be obeyed.

If this appeal to the zemindars present is a digression from my subject, I trust the Association will pardon it, and allow the importance of the subject which has drawn me aside to be my apology. I am afraid, however, that I am asking pardon only to digress a second time upon another subject of equal moment to the country, and upon which the Government scheme is altogether silent—I mean the borrowing money for Public Works.

INDIA MUST NOT BORROW.

As rulers, we are too ready to forget that men can never be free, unless they are educated to freedom, and that this is not the "education which is to be found in schools, or gained from books, "but that which consists in self-discipline, in self-reliance, "and self-government. In England these are matters of hereditary descent—traditional habits which we imbibe in our "youth, and which regulate us in the conduct of life." Here, on the other hand, everything is made a government monopoly. What Mr. Buckle affirmed some years ago of ancient France, *mutatis mutandis*, may be applied word for word to India. We cannot cut a canal, or lay down a railroad, without appealing to the Supreme Government for aid. The Supreme Executive is the great centre from which everything radiates, and in which all functions are absorbed. All improvements of any importance, all schemes for bettering the material condition of the people, must receive the sanction of the Supreme Government, the local authorities not being considered equal to such arduous tasks. The exercise of independent jurisdiction is unknown; everything that is done must be done at head-quarters. The Supreme Government is believed to see everything, know everything, and provide for everything,—to control, and regulate, and direct everything,—the whole business of the State being conducted on the supposition that no province, nor city, nor township, nor district, knows its own interest, and that outside the Supreme Council of India, there is not a man in the country fit to take care of himself. Much of this was, of course, unavoidable from the circumstances under which our power has grown up; but the Government is directly chargeable with fostering tendencies which have now become traditional with us, and with giving them a development which was certainly never known under native rule. Now all this has to be undone, as the people can bear it. Lord Mayo has done a brave and wise thing in beginning the revolution, but he must go a great deal further. With provincial Governments so capable in all respects of administering the affairs of their respective territories independently of the Supreme Government altogether, it is simply monstrous to proceed as we have hitherto done. The affectation that it is necessary for the Supreme Government to exercise financial control over the Governor in Council of Bengal, or of Bombay, or of Madras, *is* affectation, and nothing else. The Lieutenant-Governor of the North-West demands the aid of a local Council to share with him the responsibilities which this scheme casts upon him; and if the elements of such a Council are to be found, it should be given to him at once, and simultaneously therewith should the Viceroy in Council divest himself of all further responsibility for the progress of those provinces, and devolve the entire burden upon the local Government. The purely local revenues of Bengal, Bombay, and Madras, such as the land tax, should be wholly surrendered to them, *and at the same time full permission to borrow as freely as they please for works of public improvement, upon their own provincial credit.* There is no sound reason, either in State policy or good economy, for withholding this power; while I am convinced that without it the progress of the country will remain slow and unsatisfactory to the end. The *bonds* of the Madras Government, of the Bombay Government, and of the Government of Bengal, should be as well known upon the London Stock Exchange as the India Bonds of the Secretary of State, or the four per cents. of the Imperial Government. As there is plainly no intention on the part of the Home Government to assist the credit of the country with what is called an imperial guarantee, let it simply stand out of our way altogether; and instead of longer crippling the country by its selfish interference, allow us to deal directly with the English capitalist on our own credit and responsibility. The most important part of Mr. Grant Duff's recent speech in Parliament upon our finances, is that in which he speaks of this policy of borrowing money for the improvement of the land. Apostrophising those who, like myself, insist upon the wisdom and necessity of our adopting it boldly, he says:—

> "We wish we could take your sanguine view, but we do not find that the increase of the general wealth of the country shows itself anything like so rapidly in the increase of our wealth as you suppose. The great source of our income is the land revenue. That land revenue is fixed, and must be fixed for long periods, and it is only very slowly and at distant intervals that we can increase it."

But whose fault is it that the wealth of the country increases so slowly? We say it is yours, and yours only. After twenty years of agitation and objurgation, you are only just beginning to give water to the land, as part of a settled policy of improving the national estate, while you have deliberately resolved, it seems, that the country shall go without roads if it cannot make them out of taxes.

You are building your very fortifications out of loans, while India must make her roads out of taxes, although capital is so scarce in the country as to be worth 20, 30, 50, per cent. to the cultivator from whom you are taking it. You have in your wisdom given the country a system of high cost and high speed railways in advance of its wants for purely military purposes, and in the teeth of twenty years' protestations that these railways are *not* what the country requires,—namely, means of carrying cheaply to the coast the produce of the interior. Surely there never was such perversity on the part of a mere trustee. All you think of seems to be your own safety, the contingency of your own possible but most remote liability. You not merely refuse to guarantee Indian loans, but affect that it is your duty to hold back the English capitalist from advancing the funds which he is ready to give but for you. What have you to do with the matter at all? Are the capitalists of Europe unable to judge for themselves as to the propriety of lending us the money that we want? Why do you not protect them in the same way from the *not* very remote contingency of their losing the money they invest in Greek Bonds or American Railways? What is it to *you* if the English capitalist choose to invest his money in this field rather than in that? A more unworthy attitude was never taken up by a great Government towards a people dependent upon it.

The people of this country must have *roads*, and have them upon the cheapest terms if they are to grow prosperous. They have asked you for bread all these years, and you have given them a stone; and you now tell them to get bread at five times the price they can buy it for, if you will but stand out of their way. All that you could do to stereotype the poverty of the country you have done, by refusing to allow the capitalists of other lands to come to its help. Your railways, as you know, are military works more than anything else; and in offering *them* to the people in answer to their cry, you are offering them a stone, and not bread. During the last twenty years you have shut India completely off from all access to the capitalists of Europe, while the country is destitute of the commonest means of communication, and can make them for itself only at enormous cost; and you now reproach it with the fact that its wealth increases so slowly that you think it necessary to forbid English capitalists to assist it with their means! Whose fault is it? You are bound to adopt that policy of Mr. Laing's of which you speak so slightingly. Mr. Laing said truly that "no Government in Europe, "nor any private company, ever thinks of charging to current "revenue such things as extraordinary public works and interest "during construction on unfinished railways, &c., which in India " are so charged and create a deficit." In reply, you say that, "if " we could only accept it, this is an exceedingly agreeable doc-" trine, for it would show that there is no deficit at all." Well, what prevents your accepting it? Is it not true? Has it come to this—that so doubtful are you of your hold upon the country, that you must lower its credit, and misrepresent its balance-sheet, for fear that your capitalists will sink their money in the land in spite of you? Is it the fact that you build your *own* railways, and telegraphs, and canals, roads, and bridges, and make the drainage of your cities and estates out of taxes? And if it be not true, why blame us—the poorest of nations—for asking to be allowed to imitate your course, in meeting the first cost of such works out of capital?

Again—whose fault is it that the land revenue increases so slowly? It is not the fault of the country, but yours. You permit their State rights to be tampered with, and parted with, by a knot of doctrinaires to whom you entrust the conduct of our finances; and in spite of the clearest proof of the folly of their course, maintain them in office to carry through their ruinous work. You know well in the India Office the mistake that has been made of late years in thus tampering with the country's resources; and you now complain to the House of Commons that the land revenue increases very slowly, forgetting that it is your fault that it does so. I am sorry to have to retort thus upon a statesman of whom we hope great things for India; but it is the simple fact that Mr. Laing is the only financier we have had hitherto who understood our enconomic wants, and was at the same time courageous enough to insist upon the proper way of meeting them. Our duty to the people demands that we should stand out of their way. Tell the whole world by public proclamation if you like that England will not be answerable for them; and then stand out of their way, and allow the Government of India to deal directly with the English capitalist upon their own credit, just as every other Government on the earth does. The question of Public Works will never be dealt with fairly—will never be more than trifled with—while the Supreme Government attempts to do the work of the twenty different nations of which the Empire consists, and the Home Government cuts them off from all access to foreign capital for the purpose. All these pretences of the necessity of controlling what is done are pretences from beginning to end. Your control simply means obstruction and mischief. No good whatever has come of it all these years, and none ever will or can. The sooner you set completely free—just as free as are the several States of America—provinces which have a completely organized Government like those of Madras, Bengal, and Bombay, with an intelligent and powerful public opinion beside them—the sooner will you see what we all desire to see—a prosperous and progressive Empire. I believe the time has come that we should reconstitute these Governments on a broader basis, and then set them free of the old moorings altogether to conduct their own voyage in their own way to the new Atlantis. The Punjab, Oudh, the Central Provinces, and Burmah are probably not yet ripe for the change. In *their* case the first step must be the organization of a local Government upon the model, more or less, of that in these provinces. Do not run away with the notion that there is anything wild or Utopian in what I have said. It is all solid, reasonable fact, and the sooner the Imperial Government discerns it to be so, the better for us all. It has held on by its excessive power too long already, and some haste in letting it go would better suit the condition of our times than narrow talk of *increasing* the financial control of the Imperial Government. Every step in that direction is in the nature of things a wrong one, and will necessitate two backwards.

THE CAPITAL AND THE EMPIRE.

Finally,—without forcing their development, it is essential that we recognize the tendency of things. Of what does the Queen's Empire of India consist? Does it consist simply of the provinces and presidencies under direct British rule? Or does it embrace the Native States? I think there is some cowardice in our treatment of this question. We see that it involves difficulties, and we would rather let matters drift than attempt to guide them. I cannot reconcile myself to this course; it is neither wise, nor dignified, nor safe. Why should the Supreme Government not open its eyes to what is patent to the whole country—that Her Majesty is the Imperial and Paramount head of all India, of the Native States just as truly as of the territories under our direct administration. We are bound to make this fact the basis of our action. If the Viceroy as representative of Her Majesty be not the Imperial ruler of India, what business had he in Rajpootana the other day holding a royal durbar there, and affecting the right of banishing one of the Native princes from his presence for an affront? The Empire is waiting to be organized, while we do nothing but let it drift heavenwards or hellwards, we know not which, but we hope the former. I believe the time has come when, side by side with the work of decentralization so wisely commenced, we should begin to centralize, to organize, the Empire. I would have Her Majesty the Queen form a *really* Imperial Council of India, summoning thereto representatives from every Native State in the country. From the remote South, Travancore should send its representative, as the exponent of its wishes and desires; the Nizam should be represented by two or three confidential advisers; the Gaekwar also, and the Princes of Kattiawar, the old Kingdoms of Rajpootana, with the Mahratta Chieftains, Holkar and Scindiah, should all have their representatives in this Council. I know of no "lion in the way," except the unfortunate and, while it lasts, fatal objection that Calcutta is the seat of Government. I have not the slightest local prejudice in saying this. They who know the dread with which a sojourn in this city is regarded throughout India, know that no really Imperial Council will ever assemble within its gates. If we are to have an Empire, we must first get a capital. We are, as the Italians were until yesterday, without a capital. You may bring European representatives from Bombay, and from Madras, and from the North-West here, but you will never bring the native gentlemen and noblemen of India to this place as Her Majesty's Court. And yet *that* is what we should aim at steadily in our whole policy. We have to build up that Empire which the old Mogul dominion faintly shadowed, but which it is reserved for us really to attain. For many reasons it is greatly to be regretted that we cannot make Delhi the capital; for notwithstanding its decayed condition, the impression is, or until lately was, prevalent all over India, that the power which has possession of Delhi is the *de jure* ruler of India. Hamilton tells us that, "under this idea, many independ-"ent States in his day had repeatedly applied to be received as "subjects and tributaries of the British Government, and had "complained of the refusal as a dereliction of duty on the part "of that Government." He says expressly that, "for a great "many years, applications of this nature were most pressingly "urged by the Rajahs of Jodhpoor, Jeypoor, Bikaneer, "Jeysulmere, and by many other States." The statement is very striking. Had the East India Company not been a trading body in its instincts to its latest hour, it would have met these advances in the right spirit. The time is come when the Queen's Representative in India should ostensibly assume what has long since devolved upon us by the inexorable logic of events—the responsibilities and duties of the old Mogul Empire. Many of you know at a glance how much is involved in this; but the first thing of all is to get a capital. Until that is done, we can have no Empire, whatever else we have. It is simply impossible, from the physical conditions of this place, that Calcutta should ever be the capital. It will never be anything but the port of the Gangetic provinces, and the provisional residence of the Viceroy. Bye-and-bye we shall have an Indian Empire in reality, with a capital to which the gentlemen, and noblemen, and literati of the country will resort, and which they will be slow to leave as the great heart of the civilization of the land. Government should make its selection of the place, and prepare it for the reception of Her Majesty's Court, and the Imperial Departments of the State. The importance of this part of our work in connection with the subject of decentralization seems to be all but wholly overlooked. We want statesmen, we want breadth, and comprehensiveness, and insight. We want a truly Imperial Council of India, in which the conflicting claims of the provinces, the duties, responsibilities, and rights of the Native Princes, the prerogatives of the Supreme Power, and the measures necessary for the common defence and general welfare of the Empire—not the paltry affairs of the Broach taluqdars—would be openly debated, and finally settled, with all the weight the decisions of such a Council would carry.

In view of the heavy requisitions which we are making year by year upon a province like Oudh, how plainly is it necessary there should be an Imperial Council of review. We deposed the King of Oudh on the ground of his misgovernment, and constituted ourselves rulers in his room. The act at the best was one of doubtful morality; but let us suppose that the annexation was forced upon us by our responsibility to the people as paramount power. Let it be granted, I say, that we assumed the rule of the province from an overwhelming sense of our responsibilities, and from pure good-will to its inhabitants. Was it a [illegible] of our responsibilities that suggested our drafting the receipts of the Oudh Treasury into our own Exchequer, and making the people of the province contribute to the payment of our debt? For that is what we have done from the first. Allow that we have seized the reins of government in the interest of the people,—is it in their interest that we have year by year required them to pay a heavy instalment of our Home Charges and a heavy contribution to our debt? I know no reason whatever why Oudh should be saddled with our debt, that does not apply equally to Mysore, to the Nizam, and the other Native States of the country; and let no one suppose that it serves no good purpose to remind ourselves of the fact. It serves the all-important purpose of keeping us in mind that the Empire is at present a chaos; and that we must steadily fix our eyes upon the work to be accomplished, and struggle towards it. We have yet to organize the Indian Empire. The work that is being done in Germany at this moment, and that was long since done successfully in the United States, has to be done *here;* and they who forget this lose sight of one-half of the great problem of decentralization with which it is inextricably mixed up.

We have to awaken a people who have been slumbering for centuries to new political life ; to associate them with us in the great work of regenerating their country ; to bear them with us our course; and insensibly to devolve upon them a larger and still larger share of our burden, until they are able to carry it alone, and the time has come that we may rightly leave them to themselves. The Government has to keep pace with the universities it has established, and to stimulate political life amongst the people by requiring them to exercise themselves in the art of self-government, in the discharge of the duties and the rights of free men. I have said that we should at once reorganize the local Governments upon a broader basis. Without interfering with the Executive Councils, leaving them just as they are, I would largely strengthen the legislative bodies. The exclusion of the Judges therefrom by the Bill of 1861 was a purely retrograde step. The doors of the Council should be thrown wide open to all the Judges of the High Court; and it should be further strengthened by summoning thereto *ex-officio* the Chairman of the Chamber of Commerce and the President of every association or public body, such as the British India Association, the Landholders' Association, and the Trades' Association; the Principals of the Colleges, the Revenue Commissioners of the Presidency; and non-official representatives of both the legal and medical professions. The elements of a strong and truly representative Council already exist in all the presidencies, and should be seized with eagerness. Below this legislative body, it is very desirable that provincial assemblies, purely consultative or deliberative in character, should be formed. Thus, I would see the Governor of Bombay assemble a Mahratta Council every year in Poona during the rains, and a Guzeratee assembly of the same order in Bombay in the winter months. We want to bring the people into a habit of intelligent co-operation with us, and the practice of an intelligent criticism upon its acts. It is by primary assemblies such as these that we should strive to get great social questions such as *caste*, and the temple endowments, the indebtedness of cultivators, improvements in agriculture, and municipal self-government incessantly discussed. The mode of appointment to these assemblies is a matter of the smallest possible importance. We are apt to attach too much importance to the elective franchise. Let the assemblies simply be left free from State interference, and they will become inevitably representative, faithfully reflecting the wishes and opinions of the people, let them be appointed how they may. By means of such bodies, Government would place itself in close relation with the people, and the views and desires of each would be correctly interpreted to the other. I attach great importance to the periodical assembly of such bodies in every province of the country. The danger of our rule is that it is too much in advance of the people. "To seek to change opinions by law is futile; reforms so "effected are purely political, when it is necessary that they "should be national. It is a profound error to suppose that "Government can civilize the people. It may ameliorate the "surface of affairs, the symptoms of society, but it can do no "more." Regeneration must come from within—from an impulse in the heart of the people themselves. In giving the people knowledge, we are giving them the only real remedy for their superstition—the only real means of awakening them to political life. With it let us give them the opportunity of applying that knowledge to the circumstances and the wants of their country as discerned by themselves. Our watchword must be Municipal, Provincial, Imperial Freedom—the sole condition of progress.

DISCUSSION.

After the reading of Mr. Knight's paper, Baboo Peary Chand Mittra rose and expressed his regret at the absence of the leading members of the British Indian Association, who had been invited to attend the meeting. He stated that, though he had been a member of that Association from its formation, he, for one, always considered himself a representative of the people, and never advocated any sectional interests. He appeared now in the same capacity; and while he felt indebted to Mr. Robert Knight for his lucid exposition of the decentralization scheme, and the able manner in which he had handled the subject, there was one part in which he begged to differ with the learned writer. If the cess were levied on the zemindars only with reference to the jumma, it amounted to a violation of the Permanent Settlement. If it were levied on all classes as a general tax, it would not be open to the same objection. The Permanent Settlement was made because it appeared to be the best settlement at the time with reference to the prospective extension of agriculture and commerce, and the creation of a body of landed proprietors who would further the material improvement of the country. What the effects of the Permanent Settlement have been is a matter for enquiry—and that whether the settlement was made upon sufficient or insufficient data, or in some cases to the prejudice of right owners, or in some cases through the corruption of ministerial officers, *it was based upon a solemn pledge* as to the perpetuity of the Government revenue, and to disturb or violate this solemn pledge would be to destroy the moral prestige of the British Government. It was possible that, if the settlement were disturbed, and another settlement established, it would be more *beneficial* in a pecuniary point of view, but the great point was whether the faith of the Government should be broken for the sake of financial considerations. Baboo Peary Chand begged to be understood at the same time that it was a duty incumbent upon the zemindars to assist in the construction of roads, as well as in the promotion of primary education; and although he believed that some of the zemindars had already rendered services to that end, he would rejoice at the manifestation of a more active desire on the part of the whole body to carry out the important measures in anticipation of the wishes of the Government; and on this point the late Lieutenant-Governor so well dwelt in his reply to the deputation who waited upon him with the farewell address.

Mr. Beverley thought the last speaker had wandered away from the subject of the paper before the meeting. The question before the meeting was not one of the retention or abolition of the Permanent Settlement; but they were asked to aid in the solution of this great problem of decentralization, the importance of which was fully recognized if the imperial finances were to be relieved of the growing demands for purposes of local improvement. Anything on this subject which emanated from so eminent a publicist as Mr. Knight was sure to command attention, and Mr. Beverley felt sure that the meeting shared his regret that that gentleman had not been present in person to read his paper himself. He felt certain, too, that, if Mr. Knight could be induced to take up his residence on this side of India, he would soon lose that *animus* against Bengal which at present seemed to pervade all his writings. In the present paper, for instance, Mr. Knight, in condemning the Resolution of the Government of India, had characterised it as a scheme of what he called the "Bengal Civilian party;" and in another passage, he spoke of it as having been framed in the interests of Bengal. But if Mr. Knight had taken the trouble to reflect, he would have remembered that, in the Government of India, as at present constituted, there was not a single Bengal Civilian, and but one among all the Secretaries. Judging from his own experience, he (Mr. Beverley) was far from thinking that the scheme had met with the entire approval of Bengal Civilians. It was generally believed that the late Lieutenant-Governor was anything but satisfied with it. It was absurd, therefore, to call it a scheme of the "Bengal Civilian party." Mr. Knight himself seemed to halt between two opinions, for he approved and condemned the Resolution almost in the same breath. For his own part, he (Mr. Beverley) believed the scheme could not be strictly attributed to any party in particular. It seemed to him to have been elaborated by a variety of hands, and in the process of manipulation to have lost whatever individuality it may once have had.

DR. CHUCKERBUTTY thought that, as many difficult and intricate points had been raised in the lecture, the discussion of the paper should be postponed. When the paper was printed and circulated among the members, they might then have a good and proper discussion on it. If they were to discuss the subject now, it would show the weakness of the Association, and the small consideration shown to the subject. He accordingly proposed that the paper be postponed for discussion till their next Quarterly Meeting.

BABOO KOONJOLOLL BANERJEE, in seconding the Resolution, said that the subject required very close application, and that too many points had been raised for thorough discussion at the close of a meeting.

The discussion was accordingly postponed to a future meeting.

3.—*Taxes in India.* *By* T. J. CHICHELE-PLOWDEN, C.S.

[Read on the 22nd April 1871.]

TAXATION in India, perhaps more than in any other country, has ever been a most difficult problem to solve.

This has not been manifested under British rule alone, but was equally apparent in the ancient history of the country, and in the days of the Mahomedan Emperors.

It would be foreign to the purpose of a short essay, such as this is, to enter into a history of the methods of taxation current in former times; nor is it my intention, supposing I possessed the ability, to enunciate any new schemes for raising revenue. I propose, however, to examine certain taxes which are considered by many to be eminently suitable to this country, and also to discuss other forms of taxation, which are commonly in vogue among European nations.

When the unsatisfactory condition of the Indian revenues was laid before the public, many remedies were proposed by which to mitigate the present, and avert future, financial calamities. Amongst these a proposed tax on tobacco met with considerable support. It was said that an article of such general consumption could not fail to yield a large revenue, and, viewing it in the light of a luxury, that it was a most proper subject for taxation. But I hope to be able to show that its advocates have under-estimated the utility and productiveness of such a tax. First, consider its incidence. The people who would contribute the largest portion of it are amongst the poorest in the whole world, and are already heavily mulcted in the matter of salt. An impost on tobacco would be therefore most oppressive in its operation, and would also infringe a fundamental rule of taxation—the rule of equality.

Nobody disputes that luxuries, and not necessaries, should be singled out for taxation; but I contend that tobacco should be placed in the latter, rather than in the former, class. When we speak of smoking as a luxury, I think we look upon it too much from an European point of view, and we should recollect that there are people in England who call it a vice.

No such term could be applied to tobacco-smoking as in use among the people of India.

Assuming, however, that it were seriously proposed to tax tobacco, you must levy the duty either before the raw article has left the hands of the cultivator, or you must control its sale. Effectually to guard against illicit cultivation, it would be necessary to incur such enormous expense in the way of establishments as seriously to affect the profits arising from the tax. On the other hand, if restrictions are imposed on the sale of the manufactured article, the following consequences would result. The producer, in order to recoup himself for the tax, would be obliged to enhance the price of the commodity. He could only effect this by lessening the supply, and by diverting into other channels the capital that he had hitherto employed in the production of tobacco. The immediate result therefore of the tax would be to throw out of cultivation a certain quantity of land, and to allow, for a time at all events, a certain amount of capital to lie idle. It is impossible to speak with certainty to what extent enhancement of price would affect the demand; and as the productiveness of the tax depends upon the keenness of the latter, it is equally impossible to estimate, with any degree of accuracy, what income the tax would afford. In other words, although as an untaxed article, the consumption of tobacco is universal, it is impossible to say how much its sale may be checked by the imposition of a duty. I have not yet mentioned the practical difficulties that would present themselves in matters of detail; thus, the number of the excise staff would require considerable additions, the expense of which would largely diminish the productiveness of the tax; the rate of duty would require a nice adjustment, so that it should neither be so high as to encourage smuggling, nor so low as not to be worth the trouble of collecting. A high duty apart, it is probable that illicit sales of tobacco would be not uncommon. We all know what this would mean: Corruption in the excise department, demoralization in every village in India, and general increase of crime.

There yet remains to be urged a still more fatal objection than any of the foregoing. Whatever gain might accrue to the public revenue from a tax on tobacco, would be equally and more simply obtained by an increase of the tax on salt. The people who would suffer by this increase are, generally speaking, the same as those who would contribute to the tax on tobacco. A numerous establishment, which it would be unnecessary to increase, already exists for the surveillance of the salt duties, and hence there would result a saving of the whole expense of collection, so that none of the increase would be diverted from the public treasury.

I do not wish it to be supposed that I am advocating an increase of the duty on salt. I am well aware that, in many places, and in Bengal particularly, the tax on that commodity is at its highest, but my argument is that, in spite of this, it is more economical to increase the duty on salt, than to levy a new tax on tobacco. I have no doubt that the true policy in the matter of salt is to equalize the duty all over India, and eventually abolish the inland customs department, with its 16,000 employés. This, however, is a work of time, and can only be effected by an increase of the production of the article.

My remarks on tobacco and salt naturally lead me to consider excise duties generally. I believe that, for local purposes, excise might be brought to yield a much large revenue than it does at present. I should propose to effect this rather by an increased economy of administration, than by greatly adding to the duties already imposed.

Opium, gunja, taree, country and imported spirits,—these are the main articles subject to excise duty. Opium is managed by a separate department. Gunja is principally under the charge of the Magistrate of Rajshahye, while taree and country spirits are controlled by a Deputy Collector in each district. I suggest a general excise department, for the purposes of which, I should apportion the country into circles, commensurate in size rather with the Division of the Commissioner than the District of the Magistrate. The department itself should be under the control of officers whose undivided attention should be devoted to excise matters. As affairs at present stand, the excise deputy in each district has his share of the criminal work, and not uncommonly is entrusted with the treasury besides; the result is, the duty which is most unpopular, and least likely to attract the attention of his superior officers,—*viz.*, the superintendence of excise,—meets with less attention than it deserves. The recent decentralization scheme has transferred to the Local Government nine distinct charges, and it is admitted that the sum allotted to Bengal, out of the entire revenue, is less by some £350,000 than the present cost of those same charges. I cannot help thinking that some portion of this deficiency might be supplied by better management of the excise revenue.

Another tax upon which I propose to offer a few remarks is that which is generally known as a "succession duty." Theoretically, this tax has much to recommend it. It is based on the principle that the individual should contribute to the expenses of a Government, by the wise administration of which he obtains the secure enjoyment of his hereditary rights. Were it not for the security afforded by a strong Government, might, rather than right, would prevail in all matters relating to property. The possessions of a deceased proprietor, so far from descending to his possibly infant children, would become the prey of his nearest and most powerful neighbour. The tax is also a most convenient one, for the payment, being taken at a time when the worldly goods of the payer have received an increase, becomes as little harassing as possible. On the other hand, there are valid objections to a succession duty. It is a corollary to the principle upon which it has been stated that this tax is based, that all succession duties should be graduated,—*i. e.*, the more distant the heir, the higher the rate of duty to be exacted from him. In England, when a landed proprietor dies, there is not the least difficulty in ascertaining his successor; and, as a general rule, the property descends in one parcel to a single individual. It is equally easy to find out the degree of relationship existing between the deceased and his heirs; hence, in England, there is little or no difficulty in adjusting a succession duty. As regards India, the case is far otherwise. In many instances so minute is the sub-division of property, that it would be an arduous task to ascertain the interest possessed by a given individual in the estate of the person to whom he has succeeded. It would require a skilled and proportionately highly paid establishment to conduct the necessary enquiries, the result of which would be to diminish the profits arising from the tax.

Again, the tax would be a very unequal one. Take an estate which, on the death of the present incumbent, lapses to a number of sharers possessing very different interests, and connected some very nearly and others in an equally remote degree with the late proprietor. If the tax were levied according to the estimated value of the estate, either Government would suffer from the rate being too low, considering the remote degree of affinity of many of the heirs, while the nearer relations would be unjustly mulcted were the percentage raised. On the other hand, if the tax were levied from each individual, according to his interest in the property to which he had succeeded, the expense of collection, as it may be succinctly called, would seriously interfere with the productiveness of the tax. Hence I am led to the conclusion that a succession duty, though theoretically, it has much to recommend it, is, from the nature of the law regarding succession to land, unsuited to India.

The remaining impost on which I propose to remark is what is called a tax on expenditure.

The correspondence which took place on financial subjects, in the year 1859, pointed to the conclusion that, one method excepted, an income tax was the only means of raising revenue in India. The experience of 1870 will have shown that even this means cannot be relied on. An eminent writer on political economy has proposed a tax on expenditure as a substitute for that on income. Now, in India, a cess of this kind would include several of those minor and, so to speak, partial imposts, such as a tax on marriage expenses, which have lately been before the public. The principal advantages of a tax on expenditure are three in number: firstly, whether the tax be oppressive or not, depends upon the individual himself, for it is within his power to regulate his expenditure as he chooses; secondly, whereas an income tax is apt to place a man's inclination in opposition to his duty, that on expenditure will probably have an opposite effect, for there are few people who will have the courage to write themselves down as niggards; lastly, the tax is held to be a most moral one, for the people who would contribute to it are either the rich, or those ostentatious persons who desire to make a show of possessing what they really have not. In this respect the tax resembles the duty levied on armorial bearings, hair powder, and carriages; but at the same time I am at a loss to see why a tax should be moral because it chiefly falls upon the rich. The first advantage too is not strictly true, because it is only within a certain limit that a man can regulate his expenditure. Thus, a married man and a bachelor, with the same income, will almost necessarily pay very different amounts in satisfaction of the tax, and he who could least spare it would have to contribute the most. Again, the miser would be almost wholely exempt from the operation of the tax, and this most improperly, for his capital being hoarded, instead of profitably employed, represents so much loss to the country. On the whole, then, it is clear that a tax on expenditure will offend in a considerable degree against the maxim of equality.

In bringing this paper to a conclusion, I have but one observation to make. I remarked before that the correspondence of 1859 showed that, one method excepted, the only means of raising a revenue was to be found in the imposition of an income tax: that one method is now, or was lately, prominently before the public; and to it, sooner or later, recourse will most assuredly be had. Most of my hearers will have divined that I refer to a revision of the land settlement.

4.—*On Social Progress. By* MR. J. REMFRY.

[Read on the 22nd April 1871.]

IF we take a comprehensive view of the peoples now existing on the earth, and of their manners and customs, we shall not only notice a great variety in their conditions, but be convinced that they are the most civilized who have the freest intercourse with others, and that they derive thereby social advantages which are not enjoyed by those who live in an isolated and secluded condition. We shall moreover see, that as one country differs from another in its natural products, so does one people manifest maxims different from other races of the human family, and that it is only by intercourse and the interchange of kindly feeling that the good of all can be secured. It is only by the advancement of knowledge, wisdom, and understanding that truth and righteousness can be established.

In our *natural* condition we are constituted social beings :—

> " God working ever on a social plan,
> By various ties attaches man to man ;
> He made at first, though free and unconfined,
> One man the common father of the kind ;
> That every tribe, though placed as he sees best,
> Where seas or deserts part them from the rest,
> Differing in language, manners, or in face,
> Might feel themselves allied to all the race."

It was not good for our first parent to be alone, neither would it be good for any of our fellow mortals to have none others of our nature to associate with. Families are reared, and villages, towns, and cities are constituted, that society should be formed, and that mankind should live in harmony and peace together.

It has been stated that society " must pass through certain transitional phases before it can obtain a permanent fixed constitution." This has been the case in England. The changes wrought in times past, and which are yet being effected by the commingling of divers views and feelings, have so wrought on society there as to raise it to the highest state of civilization. Macaulay, in his History of England, says, "nothing in the early existence of Britain indicated the greatness which she was destined to attain. Her inhabitants, when first they became known to the Syrian mariners, were little superior to the natives of the Sandwich Islands." But "the conversion of the Anglo-Saxons to Christianity was the first of a long series of salutary revolutions. Britain, after a succession of changes, re-appears as England," and literature, science, and art have prospered ever since. "It is remarkable," says the historian, " that the two greatest and most salutary social revolutions which have taken place in England,—that revolution which in the thirteenth century put an end to the tyranny of nation over nation,—and that revolution which in a few generations later put an end to the property of man in man, were silently and imperceptibly effected." "Moral causes noiselessly effaced first the distinction between Norman and Saxon, and then the distinction between master and slave." And is not a similar process to this going on now in India? Caste feeling and prejudices, are they not giving way before enlightened and civilizing influences? And are not the sons and daughters of this mighty empire rising to freedom in all social advantages? May we not expect that the same kind of social progress which has raised England to the highest civilization—the same processes which have at last induced the English Government to enjoin that every child in that country shall be educated, shall soon obtain for the enlightenment of the rising race of India?

Education has effected, and is still bringing about, mighty changes in this land. Old barriers to intellectual and moral progress have been removed. Light has come from the West, and by the rapid communication thereof the people are rising to all social and beneficial exercises. Do we not see in the future a bright era for India—a time coming when her sons and daughters shall have acquired knowledge and intelligence; when rising generations, trained by educated mothers, shall grow up to be useful members of the State under which it may be their happiness to live; when they shall be freed from the prejudices of caste, and from those home influences which limited the sphere of intelligent action in past generations? We see this already in some measure accomplished in the means used for imparting knowledge—in the establishing schools and promotion of literary societies, and in the endowment of Universities by which the youths of India are being qualified for honorable positions under Government. We see it in the earnestness also evinced for the education of India's daughters, who, trained to virtue, are being led to occupy their proper position in society, and to become intelligent guides of household duties. But in order to educate the masses of the people, there must be a commencement at the lowest grade, and then a gradual enlightenment of the intellectual and moral powers. As in nature, there is a seed-sowing time, so in order that growth in knowledge and understanding may be promoted, there must be the early implantation of right principles, and then the training to all useful purposes.

Social progress is now seen in the enlightened views expressed by the educated Natives of India, who living under a paternal and beneficent rule, are now becoming a more united people in all kindly intercourse. Do we not express our sentiments with them more freely, and by interchange of views in conversation, and in the advocacy of right principles, are we not promoting each other's welfare? Do not all classes now associate, and are not the bonds of charity and good will extended on every hand?

In this light, social progress is a continuous going forward in all goodness of conception, design, and exercise. It is the moving principle of action in improved and still improving society. It has no degenerating nature, but gives a stimulus to every noble thought, and to aspirations of intellectual and moral feeling. It is promotive of union in the pursuit of truth and in development of kindness and charity. In instructing the ignorant, in obtaining, classifying and appropriating to useful purposes information of every kind, it has a special mission.

The definition of "sociology," then I take to be what was so well described by Dr. Ewart in his opening address of the present Session, and which was so nicely approved of by His Excellency the Viceroy, in his proposal of a vote of thanks for the same,—a science calculated to benefit society in every possible way,—a science combining principles of goodness, calculated to elevate society and confer lasting benefit on its members;—in a word, a science beneficial in its range of all philanthropic, scientific, moral, and intellectual tendencies. To aid its progress, therefore, must be the duty of all well-wishers of India, and of all who desire the extension of noble principles of action throughout the world.

As a prominent principle, implanted in our nature by the Author of our existence, the "desire of society" commends itself to our earnest attention; and this desire, stimulated to goodness in thought, word, and deed, has been considered by most writers on the subject as manifesting itself at all periods of life and in all conditions of civilization. "It is found in the union of men in civil society and social intercourse, in the ties of friendships, and the still closer union of the domestic circle." And, if our affections are guided aright in our intercourse with our fellow creatures, we shall do nothing but what is calculated to promote their good, and to bring lasting benefits to ourselves. If our desires are rightly applied, and self-love kept within proper bounds, we shall in conversation and in deportment be influential for good in all the circles of society in which it may be our province to move.

In conclusion, there is nothing in social life so influential for good as "charity," for this "is the great test of the moral condition," and is the binding principle to right action. It is promotive of peace and harmony, and is a well-spring of happiness to its recipients, stimulating them in the pursuit of all social goodness. If nations, instead of practising the arts of war in strife, hatred and jealousies, would but cultivate this "bond of peace," and exert all their civilizing processes for the good of mankind at large in all *social* greatness, then would the arts and the sciences more abundantly flourish, knowledge would be increased, and virtue and truth would be more extensively established,—"the earth would yield her increase, and God, even our own God, would bless us." With this principle paramount there would be "more abundant glories mingled with perpetual peace."

5.—*On the Decentralization of the Finances.*

By Mr. T. J. C. Grant, c.s.

It is now some four months since the Financial Resolution of December 1870 was promulgated; and people (even those who have never previously exercised their minds upon the subject) have had plenty of time to form an opinion on the great question of decentralizing the finances. I cannot hide my very great surprise at the reception which this most important measure has met with at the hands of the English public of India. It has met with much hostile criticism from some of the best and most liberal of our papers. Some prints have gone so deplorably far as to receive it with taunts and sneers, with accusations against Government of the grossest bad faith, and imputations of the most degraded cowardice. Other papers regard the measure favourably, but in my humble opinion, even the praise awarded in these shows that the real significance and value of this act of the Government has been missed, and that the courage and foresight which have been evinced in it have not been fairly appreciated. In short, whilst the scheme of decentralization has provoked some unworthy sneers and unjustifiable imputations, it has received at the best but cold and too faint praise.

If the public prints faithfully represent public opinion in this matter, I fear that, even those who regard the decentralization scheme favourably, will be ready to accuse me of using exaggerated and unconsidered language in expressing my views upon this subject. In my humble opinion the much abused Government of Lord Mayo has taken a step far in advance of those of its critics who are most advanced, and that, if this measure does not receive its meed of gratitude, it is because the Government has boldly stridden right beyond the view of those who accuse it of weakness and short-sightedness. I must venture to declare my opinion that the order of Government, which gave its death-blow to the system of rule by centralization, is, with one exception, the most socially important of all the edicts that have been promulgated in India.

To show that my words are at least not unconsidered, I may tell you that, while I express this opinion, I bear in mind the laws which gave to non-official Englishmen free access to come to India, to stay there, or to leave it, just as they might choose; which permitted them to hold lands in their own names, and gave them secure titles thereto; which threw open the services to competition as much for Natives of India as for Englishmen; and which have at last broken in upon the monopoly of a class, and allowed non-official men to take their places among the rulers of the country. The one enactment which I except as more important still, is that which gave freedom of the press to India.

I will now endeavour to show that my language is also not exaggerated; but it must be understood that I do not apply it to the mere scope and wording of the December Resolution. I look not so much to this order by itself, as to the consequences which I believe must inevitably follow from it. I am concerned with the great general principle which this Resolution announces, and not with the mere details of its mechanical application. The method of applying the principle is matter for separate consideration, and does not come within my present subject. I will concede, if you like, that there is much to object to in the practical details of the order, and that the principle confessed has not been applied nearly so deeply as it might be now, or as it must be hereafter. I do believe that, in another decade, we shall have carried the principle so much farther, that this present edict will then appear feeble and insufficient. But the guiding principle we have even now before us, whole and entire, and its results must surely follow. The outlined shadow of his mistress, which the Greek lover traced upon the wall, was poor and inartistic, but it was the origin of painting. The first printing press was slow, expensive, and rude in its results, but it was the mother of modern liberty and enlightenment. And I speak as I do of the order which announces the new Financial Scheme, because I believe it ushers in an entirely new system of civil polity in India—a new system which shall quicken the land, and arouse the dwellers in it to that sense of political existence (with all its large and ennobling duties), which the Natives of India have never yet known, and which even we Englishmen seem to have forgotten out here.

I deal, then, only with such portions of the December Resolution as declare the principle that governs it,—that is to say, with such portions of it as contain the confession, that the centralized system of administration has failed; that the system has not carried with it the knowledge necessary for success, nor if it had the knowledge, the power; and that it has, therefore, become necessary to enter upon decentralization, by partially transferring the important power of the purse to the Local Governments, for local purposes.

This important decision is, I hope, the final one in the great controversy between the rival systems of centralization and decentralization. To my mind, the most curious point in the whole of that long continued controversy is its long continuance. Theoretically, it has long been difficult for the advocates of centralization to make out such a case for it as would bear the light that modern thought has thrown upon political science. Practically, it has been working worse and worse, and yet worse, every year of its existence in this country; moreover, while our experience here has been most adverse to it, the history (even the startling contemporary history) of other nations has been placing the evils of it in the broadest light.

And yet we, in India, have clung to it, with a pertinacity that it is not very easy to account for. It is partly, I think, because we are a nation that does not dare to make the true use of history; that cannot bring ourselves to believe in history as a science, and to apply its laws as we do those of other sciences. Partly also, I think, because we are (for reasons not creditable to a self-governing people) more ignorantly timid of changes than any nation of the world. But chiefly, as I believe, because of the embarrassing position (I had almost said the false position) in which we free Englishmen find ourselves placed as the foreign rulers of this great Empire.

I think that I may safely lay down the broad and general proposition that it is not possible to carry on Government by centralization, in the case of a free people popularly governed;—in the case where the procession of power is from the people to the rulers. This seems to me to be scarcely more than a self-evident truism. It might, indeed, be possible with a free people if they are so small in number, so poor, and so homogeneous in character and religion, as to be still fit subjects for the primitive and patriarchal form of Government. This is such an exception as we can afford to ignore wholly. But the further that a people advances beyond the primitive stage of civilization, the more impossible does it become for them to submit to centralization. Civilization has a tendency to introduce multitudinous diversities among a people. Centralization has a tendency, as unfailing, to introduce strict uniformity into a Government; and from this contrary motion of the rulers and the people, there, sooner or later, is brought about a state of things that makes the Procrustean rule of a Central Government a matter not to be borne, save under absolute compulsion. In all Empires, even when they are not strikingly large and populous, there are international jealousies and rivalries to be regarded, religious differences and animosities to be allowed for, local prejudices and customs to be taken into account, conflicting class interests to be noticed, and extreme local variations of intellectual and material advancement to be considered. But a Central Government can never be in a position to know or to understand these local diversities: can never be in a position to legislate with sufficient intelligence and minuteness for them all. It cannot escape from its tendency to mischievous uniformity, and it is plain that, in attempting to measure all things by a too unvarying standard, it must give such grave offence to all its subjects in turn, that it will at last be able to maintain itself against an unfriendly people, only if it commands sufficient physical force to do so.

And the danger to a centralized Government is not only of this external kind, it carries its own ruin in itself. It may avoid in a large measure (certainly not altogether) the suicidal faults and vices of a despotism, but it cannot avoid faults as surely fatal. It is absurd—nothing less than absurd—for any Government to attempt to do all the work of Government unaided, or even to reserve the greater portion of it for itself. If a nation is to prosper, the people *must* be joined with their rulers in the task of governing themselves, and must have the largest share of the work. There are certain broad matters and questions, which we in India call imperial, that are best managed by the nation through its appointed rulers. There are other matters more local, but not less important as connected with the developing of a nation, which the people can only do for themselves, and which, if the rulers exclude the people from doing them, are either not done at all, or are done intolerably ill. The spectacle of a Central Government persisting in going beyond its natural tether, is one that has been frequently exhibited to the world, and the same ruinous result attends them all. When a Government thrusts aside the people, and interferes unnaturally in local matters, without being in a position to understand fully local requirements, without the knowledge necessary for the successful development of local resources, without so much as knowing the special wants of each province, nor its means for supplying them, the final results of that Government are not difficult to be foreseen. It is not only that the Government will both irritate and disgust the people, it is not only that it will also be in conflict with its own local agents on matters which the agents understand best, but it will fall into such grievous financial difficulties, that it will find its action crippled and hampered, more and more, day by day, in every direction, till at last it will become difficult to carry on any function of Government at all.

I will venture to take the English empire in India, as illustrating the position I have taken. Our Government is most assuredly not such as is meant when we talk of a popular Government. The rulers do not derive any of their authority from the people, are not responsible to them, and do not admit them to any partnership in the work of Government. And lastly, the Government has been, till now, essentially centralized. It is not surprising that, *at first*, Englishmen, who would have died to maintain the free institutions of their own land, followed a totally different system in India. We got our empire by the sword, and when we stood, with the sword yet in our hands, we were compelled to rule by centralization, because we could only trust the few who were for us, were compelled to exclude the people from power, because we could not trust the many who were against us. Unfortunately too, we made a disgracefully bad start as rulers. Instead of at once setting to work to assuage and remove the natural evils of conquest, the early English in India aggravated and added to them. By their sordid corruption and selfish dishonesty, they left to their successors such an evil legacy of hatred and mistrust, that, even when the uninterruptedly honest Government, which has obtained ever since, first began, there existed greater necessity than ever for still excluding the people from power and for still ruling by centralization. But it is surprising that, from the days of Lord Cornwallis downwards, till the last days of the year 1870, that same despotic form of Government has been maintained with no material alteration as the proper and necessary form for India. I believe that the propriety of, and necessity for, centralization had both ceased long before; that the maintaining it so long has wrought absolutely enormous injury; and that we owe very much to Lord Mayo's Government for having taken the first step towards remedying those injuries by the decentralization scheme of December 1870.

A Governor-General, and four or five Councillors, some half a dozen gentlemen in all, have always undertaken the responsibility of governing the whole of the Indian empire. So they did when we held nothing of India to the west of Patna; so they have continued to do till now, when the empire stretches from the Himalayas to Comorin. It is true that, as the empire grew and was enlarged, and as the demands on the energy of the small Central Government increased more and more, they gradually called in others to their aid, and Legislative Councils and Provincial Governments sprung up. But these were not allowed to take off one jot from the completeness of the centralization. The Supreme Government called in help in the mechanical work of administering and legislating, but lost no portion of its control in either department. The Provincial Governors were watched with almost jealous strictness, in every act of administration—nor could any legislative enactment become law till it had been submitted for the assent of the central authority.

And that central authority took care that its own power should be real and actual, and that the power of its Lieutenants should *not* be real, for the Supreme Government kept the control of the finances singly, wholly, and exclusively in its own hands. It was not only that the Local Governments could raise no revenue whatever for themselves—they could not even spend as they liked the money that was given to them. That money was apportioned out to them in fixed sums for specified purposes, and both the amounts and the purposes were decided absolutely by the Supreme Government alone. The Local Governments could suggest and recommend and argue upon their recommendations, but the Supreme Government could always decide against them; and in practice did so over and over, and over again, even upon matters which to the Local Governments seemed simply vital. We call them Local Governments, but I need not remind this meeting that there cannot be any Government in the proper meaning of the term, where there is no control over finances—no power of the purse. Till now there has been but *one* Government in India—that central power which could, and did, control all the administration of its subordinates, which could veto any of their legislative enactments, and which retained in its own hands the absolute and undivided power of the purse. This closely central method of Government has been at length infringed upon, and we are now in a position to look around and see what it has done for the country, and for the government of it, and so form a judgment upon its merits, after it has had a trial of one hundred years.

A review, such as I talk of, of our position in India, is, of course, more than I can think of attempting to undertake now. It would provide much more than enough of subject-matter, if the whole evening were devoted to the consideration of nothing else. Moreover, I find the subject by no means so alluring as to tempt me to linger on it longer than I can help, so I promise to be as brief as possible. A short time ago, I enumerated the difficulties and dangers which I believe must always attend upon strict centralization in Government. I will refer to the present condition of the country, only in so far as it illustrates my remarks, and this at no greater length than will suffice to explain them.

In the first place, then, I said that a Government which is not popular in form, but which is centralized, would be in great danger of giving grave offence to all its subjects in turn—would at once irritate and disgust them all. I ask how did the centralized Government of India stand in regard to the affection and respect of all classes of their subjects? What legacy has it left to decentralization? Wherever we look for an answer, I fear we shall get but a sad one. Let us take the English section of the public first. Here the Government is relieved of one great obstacle to success, because it is of the same nation as its subjects. Here, too, by the circumstances of the case, it might look for indulgent critics and for natural allies. But the fact is that there has been for many and many a year past nothing but quarrels between the English in India and the Government. I doubt if any man alive remembers the time when there was accord between them. There is something very pathetic in the way in which Englishmen here hail the advent of every fresh Governor in the hopes that he will bring peace at last. And in the way in which Governor after Governor leaves these shores, weary with his contests with the English, the quarrels seem to have become chronic. The unfortunate history of the late financial crisis has greatly widened the breach in our day. And whilst it has caused the English public to give way to a great access of anger against the Government, it appears but too plain that this has been attended with a serious loss of respect of each for the other.

If we take the native public, there is the same story of estrangement—a story which is here far more important and far more significant. It is the same whether you look among the keenly intellectual and highly educated gentlemen, whose good opinion must be essentially valuable to the Government, or amongst the ignorant, credulous, and easily swayed masses, whose bad opinion no Government can afford to despise. It is not possible to shut the eyes to the disheartening fact, that there has long been a growing coolness between the English and the more thoughtful Natives. Things have come to such a pass, that there is a great, almost a total, lack of sympathy between the two classes. The ruling class, unfortunately, seems to care very little about this, and continues to solve all questions and adopt all measures, in accordance with its own one-sided views, and in utter disregard of the deep convictions and the remonstrances of the subject class. But it has become too plain to be concealed that this has raised in the minds of thoughtful men among the Natives, a deep feeling of distrust—I might even say resentment.

With the mass of the population our case is still worse. I do not believe that we have ever, at any time of our rule, so governed as to reach their confidence. It has come to be a sort of standing axiom with all who write about our rule in India that our national respect for truth has so impressed the Natives that it has become one of the most powerful engines of Government in our hands. This belief in the implicit reliance placed by Natives on the word of an Englishman is one of the most extraordinary of all the delusions with which we English flatter ourselves. How we out here contrive to delude ourselves with it, in the face of history, in the face of our daily experience, is more than I can understand. In the case of the great body of Natives it is strictly and altogether untrue. The truth is that the great body of the Natives of this country always have been, and still are, ready to believe anything, however wild and ridiculous, that tells against us, and will believe nothing, however plausible and plain, that tells in our favour. So it was in the days when Lord Cornwallis promulgated the perpetual settlement, and so we found it to be still in the days of the Mutinies. In 1857, the most solemnly pledged and impressive assurances, publicly uttered by British statesmen and accompanied by proofs of sincerity that seemed not short of demonstration—gained absolutely no belief whatever from the Natives. On the other hand, the wildest and most palpable fictions—secretly uttered by men of no responsibility or character—and which charged the Government with impossible crimes, at once infamous and childish, were believed in with the most unreserved belief, as telling of nothing which was not naturally to be expected from the English. Be the causes what they may, it cannot be doubted that the masses of India, so incredulous of good and so credulous of evil, were greatly alarmed by the late high rate of income-tax. And it was only the other day that a Lieutenant-Governor of Bengal prayed that a census might not be taken just now, because, notwithstanding the public pledge of the Government that the census did not mean further taxation, the Natives of Bengal continued to decidedly believe that it most certainly did.

Nor is it only the uneducated classes who thus strongly and genuinely believe ill of us, and who do not believe in our publicly pledged word. To my astonishment I have found well educated native lawyers (vakeels)—men whose life is passed in sifting facts and weighing evidence, and whose profession is a very antidote to credulity—who still vehemently express their belief that the Eastern Bengal Railway Company, after an accident on their line, *did* fling into the river waggon loads of mutilated men, while they were yet alive, merely to conceal the full extent of the calamity.

I have said that a centralized Government will estrange its subjects, because, by its very nature, it can never be "*en rapport*" with them, because it cannot hope to understand all the many varieties of prejudices, of opinions, of customs, and of circumstances which are to be found in all large Empires. It may be argued that the estrangement I have instanced is due not to centralization, but to the measure taken in the late financial crisis. To this I would answer, first, that the financial crisis itself is a product of centralization; and next, that the objection is wholly inapplicable to the case, because the financial crisis is a thing of yesterday, and the estrangement is generations old. The cause of the estrangement, of both the English and the Native section of the public, is common to both. Neither the Englishman nor the Native can patiently endure to see themselves excluded from all share in the government, even from that share which seems most to be their own. It grates harshly on them both, to be excluded from even that indirect share which is often obtained by the expression of public opinion. When people feel that they can think for themselves, they find it intolerable to have all the thinking done for them by others. It seems to me quite undeniable that the English rulers of India have all along kept the right of thinking too much to themselves. Honestly and earnestly they are determined to do good to the Native, and to do it in spite of him. If the Native differs from the Government as to the method of doing himself good, his objections, though deeply felt and strongly put, are too often overruled or disregarded. It cannot but be that the Native is deeply hurt at this, and the misfortune is that the more energetic and actively zealous the Government becomes, the more does the breach with the Native widen as a consequence. Every mistake (and they are not few) that the Government has made in its efforts to do good in spite of the Natives, is remembered and brooded over. Nor is it only the larger and more important actions of the Government that give offence to the Natives—they are almost as much galled by the efforts at minute rule. They remember that the same Government which put the horrible resumption laws in force, and which unconsciously collected the revenues of Madras by torture, also wrote grave minutes on the mighty shoe question; and that the same Government which let a whole Province starve, also put on record a censure of the manners of their schoolboys.

I have said that a centralized Government will fail, at one time, for lack of local knowledge, and at another, for lack of power where it has the knowledge. One and the same Province can give a striking instance of each kind of failure. In 1866, there was a scarcity of food over a great part of Bengal, and a desolating famine in the Province of Orissa. The simple reason why that famine became so widely fatal is that Government knew nothing of the very striking and peculiar wants of that Province. It did not know that, owing to a deficient natural supply of water, the country was peculiarly liable to famine; and it did not know that, whenever famine might come, the country would be, for many months, in the position of a besieged and blockaded city, and could not be approached or supplied from the outside. This was an instance of failure from want of knowledge.

Again, it was shown, with unusual precision and distinctness, that Orissa would never be safe from famine—might be subjected to it any or every year—until it was supplied with proper irrigation works. The necessity for such works has been fully admitted and accepted by the Central Government; and yet, though so long a time has elapsed since the admission was made, the irrigation of Orissa has not progressed at all. And why? because notwithstanding the vehement urgency of the officials of Orissa, and the emphatic remonstrances of the Local Government, the central administration (with the very best intentions in the world) is obliged to stop the work from sheer want of funds—although, during this present season, Orissa has had the narrowest escape possible from another dire famine. This is an instance of failure from want of power.

It is not necessary for me to give any instances in support of my remark that a Central Government will find itself in conflict with its own Lieutenants on local matters. It will suffice to refer to the December Resolution itself, which admits that, owing to the old pure centralization, "there have occurred conflicts of opinion injurious to the public service." Nor could any other result be possible. The Central Government held the purse, but had neither the deep, immediate interest in the welfare of the local provinces, nor the full understanding of local requirements, which were requisite for a proper use of the money. The Local Governments had the requisite immediate interest in, and understanding of, the local requirements, but had no money with which to supply them. Sometimes a province would come heavily to the ground between the two; and then both Governments would be apt to repudiate a responsibility which neither had the means of properly fulfilling.

Finally, I said that a Central Government is almost certain to break down grievously in financial matters. This also is a point on which there can be no occasion for me to say much by way of instance. The department of the finances is the one in which the centralization has been most absolute—the one over which the Supreme Government has exercised exclusive control. And what has been the result? There is the fact—a fact which conveys the very strongest condemnation possible—that, in the face of a healthy revenue, increasing not only steadily but largely, year by year, we have yet been approaching rapidly, year by year, to the very verge of national bankruptcy. Nor is this all; whilst this gigantic evil was going on, we knew nothing of its existence, and actually believed that we stood on the right side of the book. And it must be remembered that this is not a solitary instance. It has only been the latest of a long series of financial breakdowns, which have been constantly recurring, ever since we have had an Indian history. They are matters of such notoriety that Indian finance has become a bye-word. That the failures are greatly, if not altogether, attributable to close centralization, seems beyond dispute. The December Resolution of the Government means nothing if it does not admit that.

And now I have done with the major portion of my case against Government by centralization, and have little more to say. I have stated a set of evils which I believe to be inseparable from such a system in any country. I have endeavoured to show that these evils have one and all displayed themselves in our long government of India; and I have endeavoured to illustrate the case of each of the evils I have named, by instances. To save time I have contented myself with only one illustration to each point. If I have chosen them well, they will doubtless suggest many others to you, and I think that those I have given both explain my remarks and support my views. I have selected such matters only as are plain, and unquestioned by men of all opinions, and have endeavoured, lastly, to prove that all these evil things are directly due to Government by centralization. If I have had the good fortune to carry my audience with me, they will now understand why I have expressed myself so strongly on the decentralization of the finances,—why I have not hesitated to call the December Resolution the most important of all the Indian edicts save one,—and why I claim for the Government which promulgated it a far higher degree of gratitude and recognition than it has yet obtained. And here I would beg to impress upon you that, in speaking as I have of the English Government and the system it has worked upon, I have done so without any special reference to the statesmen now holding office, or to any of their predecessors personally. My arguments and my illustrations have had reference to our Government in the abstract—to our Government as a whole, from the earliest times down to the end of 1870. They have been directed not against men, but emphatically against a system—against that system of which the present Government, and the great majority of its predecessors, have all along been the victims. Lord Mayo's Government, with obvious reluctance and regret, applied a very severe remedy to the country, after the late financial crash, and (speaking for myself), I think that the public, smarting as it still is from those severe remedies, is not in a fit state of mind to deal justly with the Government. I think that the public forgets that the Government is not only not responsible for the crash itself, but is also not responsible for the bad system which led up to it. A wrong system of rule had been long in vogue (long before the existence of Lord Mayo's Government), and it had long been laying up a crop of evils—especially financial evils—which must inevitably have shown on the surface some day. They came to the surface during Lord Mayo's Government. Others had sown the wind, they are reaping the whirlwind; and in time I believe the public will recognize this. It will then be remembered that though the present Government applied the painful remedy, it had not produced the malady—that it was Lord Mayo's Government that saved us from a much worse fate by dragging the lurking evil into light; and that it was his Government that first publicly declared the errors of centralization, and took the first bold steps to abandon the system which bred them.

Hitherto I have considered the question only in one aspect—only in so far as it works detrimentally against the rulers who use centralization. There remains the other, and far more important point of view, that in which it works immediately and detrimentally upon the people. The very worst of all the great evils of a centralized Government is that, however filled with a sense of duty the rulers may be, however honest and active they may be, they paralyze all who are brought into contact with them. They not only paralyze their own subordinate agents, but they destroy the political life of the whole body of their subjects. I have said before that it is a misuse of terms to call that a Government which has no power of the purse, and I do not think it can be doubted that the Provinces are not now-a-days worked with the same brilliancy and effectiveness that marked the early days of our rule. Sir William Muir in the North-West joyfully hailed the new system as substituting a real Government for a sham, and I think that we in Bengal may rejoice for the same cause. Many people say that, in executive matters, the Bengal Civilian has lost all skill in administration, and that, on the bench, he merely plays at being an English lawyer, imitating, with all an amateur's proverbial success, only what is vexatious and objectionable in the courts of law at home. This may be an exaggeration, but it is an exaggeration only of that grave and memorable verdict against the Bengal Service, which was recorded by the Commissioners who enquired into the fatal executive failures which so miserably heightened the effects of the famine in Orissa. I have heard Bengal Civilians lament that a general dead level, barely relieved by one or two prominent names, marks the whole Bengal Service throughout, and I have heard the same laments made concerning two other Provinces. But the thing is more apparent than real. The able men *are* there, and many of them have shown before this Association and elsewhere that there is in the Bengal Service much energy and eagerness to be active, much strong thought and capacity for grappling with practical problems. That they will at last be able to exercise these qualities in their profession, under a real Government, newly instinct with life, is not the least of the advantages that will follow upon decentralization.

But the last charge I have to bring against centralization is the gravest—the one in which all others are summed up and included. I charge against that system that, even when it is administered by men of the rarest ability, with the purest unselfishness, zeal, and public virtue, it is still hopelessly incapable of doing anything for the people. I charge against it that it, and its work, are in no respect national; that it is a mere external excrescence, which has no root whatever in the nation, but draws its life from mere physical power apart from, and outside of, the nation. I say that when such a Government comes to an end (and a Government which has its roots abroad is in constant danger of coming to an end), it will be found that, in the fullest meaning of the words, it has done nothing for the people. With the Government its healthiest institutions will die. Its good works will perish with it, and it will be succeeded by inevitable anarchy. For there is no social truth more absolutely certain than this :—that no people which has been for generations excluded from all share in governing themselves, can possibly succeed in that most tremendous of tasks when they first undertake it. In India, we flatter ourselves that we are *educating* the Natives into fitness for the task, but education will never fit any one for it. A man might just as well hope to be able to play the violin by reading instruction books only. Practice—the actual practice of the art—is as essential in governing as in playing the fiddle. I would ask you to look at the case of the great French nation. Less than one hundred years ago they swept away their centralized Government, and, after having been for centuries kept out of the work, first undertook to rule themselves. Their leaders were men of extraordinary abilities and education—nay, they had turned their vigorous thinking powers with especial energy to working out the theory of Government—and the Government of these unpractised theorists led directly to the most awful anarchy that has ever convulsed the world—an anarchy proportioned to their total want of practice—an anarchy which has been succeeded by other lesser ones, but always so great and appalling that the nation has thrice since then voluntarily reverted to the despotism of central rule—even of personal rule—as a refuge from the learned and sincere but unpractical friends of true liberty.

Such is the nature of this last charge that I make against what I hope I may call the old abandoned system. Perhaps some who have heard me say so much of the failures of centralization, may think that I ought in fairness to have said something of its success. To tell the plain truth, I think that there has been an altogether false and unfair use made of those successes. God forbid that I should deny or decry those successes and the benefits they have bestowed upon this land. I need not recite them all. I will but indicate such things as the introduction of security and order into our empire—the honesty of our courts—the public virtue of our public servants—the enormous increase of trade and commerce—the making of rail-roads, canals, and telegraphs, and the flood of things which make up what we call material progress,—for why should I enumerate things which every Englishman knows and glorifies himself upon even if he knows nothing else about India. But I think it well worth while for us all to consider how much of our good work we can fairly attribute to ourselves as Englishmen ruling India. For I would ask you to observe that they may all be classed under one of two heads. They are either such benefits as naturally follow in every country upon the blessings of security and good order, or they are those which necessarily result from common honesty in the rulers. They do not depend upon us as Englishmen, on our national character, on our love of freedom, or on the spread of our political and social ideas. They would follow if our place here was taken by the greatest despots of Europe, if those despots had a position unassailably strong, and such honesty as mere selfish prudence would suggest. Just such national prosperity accrued to France when the personal government of the Emperor was too strong to be molested, and just such an honest administration of the laws did the French enjoy when no political considerations swayed the courts. There, as here, the Government arrogated to itself the credit of the nation's advance in material prosperity. I believe that, in both cases, the claim is altogether inadmissible, that material progress can no more be created by a Government than fair weather for the crops can be, that it comes purely from the people, and is the inevitable product only of national energy and enterprise, when the Government does not interfere with them either in a manner directly hostile or with well meant but officious meddlesomeness.

Then, again, we say we have *introduced* this large and increasing amount of material national prosperity, but our work is not to introduce it merely, but to establish and secure it. As long as they depend for existence upon public security and good order, and as long as public security and good order depend on the continuance of our rule in India, so long we English cannot be fairly said to have done to India the good works we claim to have done. They are a mere appanage of ourselves, which we keep here as long as we stay here, and which we take away with us when we go. If we were to withdraw from the country to-morrow, what would become of all our work, or rather, would it not be then apparent that we had done no real work? We would be like the gardener in the Arabian tale, who planted groves of green boughs, and filled *parterres* with gathered flowers, and the garden which he had made in a night withered in a day! So too our labours have struck no root, but if they are to live must strike home to the hearts of the people. If our works are to live we must cease to do them exclusively with our own hands, and must call in the Natives to help us. We must cease to do all his thinking for him, and begin to think with him. We must let him have his own share with us in managing our joint concerns. We must give him such a share in the practical government of his country as will enable him to continue our work should we go. So shall our labours and the prosperity of this great empire be made permanent, when the body politic shall no longer be living only in its head, but be instinct with vitality in every limb.

To do this is the inevitable tendency of decentralization, and all who live in India owe a lasting debt of gratitude to Lord Mayo's Government, because it saw that tendency, and for that very reason granted the boon. It is true that the December Resolution has carried us but a short way on the road, but the further advance to the end is not to be avoided. To me it does not seem difficult to foresee the decentralization of Bengal. Within that Government are included various nations exhibiting the very widest diversities of character, language, intellect, and civilization. It runs all through the gamut from the English of Calcutta through the Bengalees, the Beharees, the Ooriyas, and the Assamese, down to the wild tribes of Chota Nagpore and the borders. It has an enormous area, and I do not know of any one reason for decentralizing the Supreme Government, which will not apply, in time, with equal force to the decentralizing of Bengal, and so will it be with other Provinces. The more they prosper, the more must we decentralize; and the more we decentralize the more necessary will it be to govern by a very extended use of both Native and English agency. I believe that the time will come when the administration of this country will not widely differ from that of England; when the Government will leave all local matters to the people, and allow them, Native and English, a potential voice in the general affairs.

I recognize one great obstacle which stands in the way. I speak of that unhappy want of sympathy between the English and the Natives, of which I have before made mention. When the two classes are called on to work together, this want of sympathy may interfere fatally to prevent all fusion, and to make the separation more marked. It is not for me to say which side is most to blame for the present undoubted estrangement, but I think I may say that we English can remove it if we will earnestly set about it, and that it is we who will chiefly benefit by a cordial reconciliation. It would be immeasurably to our advantage if we could bring ourselves to be less dogmatic, less bent upon getting our own way, more tolerant of adverse criticism, and less blindly convinced of the invariable correctness of English points of view and of the superiority of English ideas. Nothing more is wanted than that we should acquire a full comprehension of the real fact, that while we have certainly much to teach the Natives, we have certainly much also to learn from them. It is in our power to bring about cordial relations, and we have every inducement to make the sacrifice of false pride and false prejudices, which is all that is needed for the purpose. We should do it for the sake of our national reputation, for the sake of accomplishing the great work we have undertaken in this country, for the sake of our own personal position whilst we live here. The position of the English in India is one of the most anomalous of all political phenomena, and it is plain that it is becoming more and more irksome and intolerable every day. We are a people who absolutely revel in our own sense of freedom. We love liberty for its own sake, so much that we have the liveliest and most genuine interest in the freedom of others, and shout and rejoice at any successful struggle for freedom in other nations, as if some victory had been immediately achieved by ourselves. We especially pride ourselves on certain great privileges, which we consider to involve the first principles of a free constitution. At home we would all instantly take up arms against any rulers who sought to subject us to laws which we ourselves had not made, or who sought to levy a penny that we had not ourselves consented to give. Yet out here are to be found crowds of Englishmen whose political life is passed in direct contradiction to their cherished political creed. The great majority of us have never had anything more to do with the Government of our country, here or at home, than our punkah-pullers have. We live without protest under a body of laws, to not one of which have we ever given, or been asked to give, our consent. Under one of those laws we allow ourselves to be punished severely as criminals for actions which, in our own country, are not criminal at all; and we pay up heavy taxes, not only levied without our consent, but in spite of our plainly expressed dissent. I doubt if the history of the world can show such another anomaly as the Englishman in India—so complete and strange a divorce between principle and practice.

To my mind the spectacle is a very grand one. It is only a people elevated by generations of freedom, that could thus confidently give up their liberties to their rulers, and exercise such firm self-control and self-denial for the furtherance of a noble national undertaking. But if there is any sincerity in our political and civil opinions, we do not mean this state of things to last; we look for the day when we shall be at liberty to be as free here as at home. Nevertheless, while we permit the continuance of an estrangement with the Natives, which it is in our power to remove, we are ourselves blocking up the only path that leads to that liberty to be free, for our road lies through the hearts of the Natives; and till we can act in friendly unison with them, we must be content to pass our lives out here, rather as if we were the subjects of the late French Empire, than like Britons proud of being their own rulers. If then, we go no higher than considerations of personal comfort and self-respect, is it not well worth our while to show a warmer consideration for the Natives? And is it not still more worth while, if we consider our national duty and reputation? When we loudly sympathize with the Poles, the Italians, the Spaniards of Europe, their tyrants sneer at our enthusiasm and point to India. We reply proudly that we hold this country only to restore it to its high place of usefulness to the world; that we hold it only until we have taught the Natives how to govern it for themselves. We can gain no belief, and why? Because if we were to leave India to-morrow, we are open to this reply: "You have never "tried to teach the people to rule. You have chosen a system "like ours, like that of the French Empire, which could not "possibly teach the people to rule, and did not intend to. The 'good you have done, you have done selfishly for yourselves. It 'belongs to you, and has not been planted in the country. 'When you go, the good goes with you. Anarchy succeeds 'you, and the world learns that the task you have pretended to 'work on for one hundred years has never been even begun." It would be very hard to defend ourselves from such a statement, as far as the past is concerned; but Lord Mayo's Government has given us an opportunity of making the defence easy for the future. We are now about to introduce the elements of free Government—of self-government. It depends chiefly on the English inhabitants of this country whether such Government can hereafter be introduced to the full. If we throw away that opportunity it will be hard to say that we deserve our position out here. It is a very grave consideration for us, for all Englishmen who will soon be called on to act with Natives. I would urge all such to let their contact with their native colleagues be real, to let there be a genuine action and reaction between the two races (as there must be if the contact is real), and not to let us English keep superciliously aloof, deciding all questions in accordance with our limited British ideas and our large British prejudices.

LIST OF PRESENTATIONS

RECEIVED BETWEEN JUNE 1870 AND DECEMBER 1871.

From the Government of India, Home Department.

Report on the Administration of Mysore, 1868-69	1
„ „ of the Bombay Presidency, 1868-69	1
„ on Public Instruction in Mysore, 1868-69	1
„ on Trade and Customs for 1868-69, (Burmah)	1
Selections from the Records of Government, N. W. P., 2nd Series, Vol. II, Nos. II, III, and IV.	3
„ „ of the Government of the Province of Oude Groves	1
„ „ Indebtedness of Cultivators	1
„ „ of the Government of the Punjab—	
No. IV., Administration of the Bhawulpore and Chumba Estates	1
No. VI., Sanitary Survey of the Villages watered by the Western Jumna Canal	1
Report on the Convict Settlement of Port Blair for 1869-70 and for 1870-71	2
Selections from the Records of the Government of India, Home Department.—	
No. LXXIV, No. LXXX, and No. LXXXIII. Reports of the Trigonometrical, Topographical, and Revenue Surveys of India, for 1867-68, 1868-69, and 1869-70	3
No. LXXII. Note on Jails and Jail Discipline in India, 1867-68. By A. P. Howell, Esq., C.S.	1
Memoirs of the Geological Survey of India. Vol. II. Part 2. Coal-fields of Kurhurbari and Deoghur	1
Deaths in Madras during 1868	1
Bibliotheca Indica. New Series	1
Ain-i-Akbari. Fasciculi IX, X, and XII	3
Records of the Geological Survey of India. Vol. III. Parts 3 and 4. 1870	2
Report on the Operations of the Post Office in India, 1869-70	1
Jail Report, Punjab, 1868	1
Annual Sanitary and Medical Report on the Settlement of Port Blair for 1869.	1
Selections from the Records of the Government of India, Foreign Department.—	
No. LXXXII. Report on the Political Administration of the Territories comprised within the Central India Agency, for 1869-70	1

From the Government of Bengal.

Report on the Administration of the Certificate Tax under Act IX of 1868, in the Lower Provinces, for 1868-69	1
„ on the Administration of the Customs Department in the Bengal Presidency, for 1869-70	1

Report on the Charitable Dispensaries under the Government of Bengal, for 1869	1
„ of the Sanitary Commissioner for Bengal, for 1868 and 1869-70 ...	2
„ on the Progress of Education in the N. W. P., for 1867-68 and for 1869	2
„ on the Police of the Darjeeling District, for 1863	1
„ on the Sanitary Administration of the Punjab, 1868	1
„ of Cases heard and determined in the High Court of the N. W. P., in 1870, Vol. II. Parts I—IX.	9
„ on Dispensaries and Lunatic Asylums in the Province of Oude, for 1869	1
„ upon the Administration of Civil Justice in Oude, for 1869 and 1870 ...	2
„ „ „ of Criminal Justice in Oude, for 1869 and 1870	2
„ on the Vaccination Proceedings under the Government of Bengal, 1870	1
„ on the Police of the Lower Provinces of the Bengal Presidency, for 1868, Vols. I. and II.	2
„ on Hospitals and Dispensaries under the Govt. of Bengal, for 1868 ...	1
„ on the Result of the Administration of the Salt Department under the Govt. of Bengal, during 1868-69	1
„ of the Land Revenue Administration of the Lower Provinces, for 1869-70	1
Selections from the Records of the Madras Government, Nos. XIII. and XVII. Papers relating to the Uncovenanted Civil Service Examinations held in 1867, 1868, and 1869, in the Madras Presidency ...	1
„ No. XVI. Annual Report of the Medical College at Madras, Session 1868-69	1
„ No. XII. Report on Civil Dispensaries, for 1867	1
„ from the Records of Government, N. W. P., Second Series, Vol. II. No. III.	1
„ &c., Madras Government. No. XIV. Papers relating to the Survey and Settlement of the Chellumbrum and Manargoody Talooks of the South Arcot District, 1869	1
„ No XV. Report on Public Instruction in the Madras Presidency, 1868-69	1
„ No. XVIII. Annual Report of the Civil Dispensaries, Session 1868-69	1
„ from the Records of Government, N. W. P., Vol. III. No. IV, and Vol. IV. No. I	2
„ from the Records of the Government of India, Home Department, No. 77. Papers relating the Nicobar Islands	1
Records of the Geological Survey of India, Vol. III. Parts 1, 2, 3, and 4 ...	4
Sanitary Report for Oude, 1868-69	1
„ and Vaccine Reports for the Province of Oudh, 1869	1
Report on the Administration of Civil Justice in the Punjab and its Dependencies, during the year 1868...	1
„ on Civil Justice, for 1868, in British Burmah	1
„ on the Administration of Civil Justice in Oude, 1868	1
„ on the Financial Results of the Excise Administration in the Lower Provinces, for 1868-69 and 1869-70	2
„ on the Popular Education in the Punjab and its Dependencies, for 1868-69	1
„ on the Administration of the Punjab, 1868-69	1
„ „ „ N. W. P., Do.	1
„ „ „ Madras Presidency, Do.	1
„ „ „ Bombay Presidency, Do	1
„ „ British Burmah, Do.	1

Report on Public Instruction in the Madras Presidency, 1867-68	1
„ of the Committee of Landholders' and Commercial Association, 1869	1
„ on Public Health and Vital Statistics, for 1868, in British Burmah	1
„ on Vaccination, for 1868, in British Burmah	1
„ on Hospitals and Dispensaries, for 1868, in British Burmah	1
„ upon the Revenue Administration in Oude for year ending respectively the 30th September 1868 and 1869. Part I. Revenue	1
„ „ „ Part II. Settlement	1
„ upon the Progress of Education in the Province of Oude, 1869	1
„ on the Jails of the Lower Provinces of the Bengal Presidency, for 1868. Vols. I. and II.	2
„ on the Charitable Dispensaries under the Government of Bengal, for 1868	1
„ on the Administration of the Central Provinces, for 1868-69	1
„ „ of the N. W. Provinces, 1869-70	1
„ „ of Coorg, for 1868-69	1
Annual Report on the Administration of the Bengal Presidency, for 1868-69	1
Report of the Calcutta Court of Small Causes, for 1869-70 and 1870-71	2
Administration Report of the Calcutta Municipality, for 1870	1
Report by the Board of Revenue on the Revenue Administration of the N. W. P., 1869-70	1
„ on the Police of the Town of Calcutta and its Suburbs, 1870	1
„ on the Abkari Administration, Punjab, 1869-70	1
„ on the Marine Dept. and Dockyard under the Government of Bengal, 1869-70 and 1870-71	2
„ on the Administration of the Salt Dept., 1869-70	1
Records of the Geological Survey of India. Vol. IV. Parts 2 and 3	2
Practical Hints to Emigrants intending to proceed to Tasmania	1
Report of Cases heard and determined by the High Court, N. W. P., in 1871, Vol. III. Part I	1
Annual Report on the Administration of Criminal and Civil justice in the Courts of the Recorders and the Small Cause Courts of Rangoon and Moulmein, during 1868	1
„ „ of the Lahore Lunatic Asylum, 1868	1
„ „ on the Operations of the Post Office of India, for 1868-69	1
„ „ of the Insane Asylum in Bengal, for 1868	1
Cases determined by the High Court of Judicature, N. W. P., at Allahabad, in its Appellate Jurisdiction (Civil), for July, August, and September 1869, being Vol. I., Parts VII., VIII., IX., XI., XII., and XIII.	6
Selected Cases determined by the High Court, N. W. P., Appellate Jurisdiction (Criminal). February—December 1869	1
Jail Report, Punjab, 1868	1
„ „ Oude, 1868-69	1
Statistical Committee's forms to accompany the Annual Report of the Province of Oude, 1868-69	1
Narrative of the course of Legislation by the Council of the Governor-General, during 1868-69	1
Medical and Sanitary Report of the Native Army of Bengal, for the year 1869. By Surgeon-Major J. T. C. Ross, Secretary	1
Administration Report of the Jails of the Lower Provinces, Bengal Presidency, for 1869. Vols. I. and II.	2
Dispensary Report, Punjab, 1868	1
Record of the Kurrachee Fair and Exhibition, 1869	1
The Annals of Indian Administration in 1868-69 and 1869-70	2
Moore's Indian Appeal Cases. Vol. XII. Parts I. and II.	2
Progress Report of Forest Administration in Bengal, for 1869-70	1
Collection of Oriental Works published by the Asiatic Society of Bengal, No. 193	1

From the Government of the North-Western Provinces.

Selections from the Records of Government, N. W. P.—	
Second Series. Vol. III. Nos. II. and III.	2
„ „ Vol. IV. Nos. II., III., and IV.	3
„ „ Vol. V. No. I.	1

From other Sources.

Transactions of the National Association for the Promotion of Social Science, London, 1869	1
Journal of the Agricultural and Horticultural Society of India. New Series. Part I. Vols. I. and II.; Part II. Vols. I. and II.; Part III. Vol. I.; and Part IV. Vol. I.	6
English Legislation for India. By A. M. Broadley, Esq., C.S.	1
Report of the Calcutta Public Library, 1870	1
An Address. By Lalla Budree Persaud	1
Journal of the Behar Scientific Society	1

LIST OF MEMBERS FOR 1871.

Abdool Lutif, Moulvi, Calcutta.
——— Qadir, Moulvi, Midnapore.
Abul Hossein, Said, Buxar.
Adley, C., Nurbudda.
Amir Ali, Moonshi, Calcutta.
Amir Hossein, Said, Bhaugulpore.
Ardaseer Dhunjeebhoy Wadya, Bombay.
——— Framjee Moos, ditto.
Atkinson, W. S., Calcutta.

Banerjea, Bhairub Chunder, Calcutta.
———, Durgagoti, Patna.
———, Rev. K. M., Calcutta.
Koonjo Lal, Bhowanipore.
———, Peary Mohun, Calcutta.
———, Poorna Chunder, Calcutta.
———, Shosi Podo, Burranuggur.
———, W. C. (Attorney), Calcutta.
———, W. C. (Bar.-at-law), ditto.
———, Woomesh Chunder, ditto.
Barton, E. J., c s., ditto.
Beveridge, H., c.s , Burrisaul.
Beverley, H., c.s., Calcutta.
Blanford, H. F., ditto.
Blochmann, H., ditto.
Bose, Ambika Churn, Bhowanipore.
——, Beressar, Calcutta.
——, Bhagoban Chunder, Burdwan.
——, Chunder Nath, Calcutta.
——, Denonath, ditto.
——, Koylas Chunder, ditto.
——, Lukhi Narain, Chitpore.
——, Mohes Chunder, Bhullooah.
——, Nil Madhub, Calcutta.
——, Sham Chand, ditto.
Bowerman, J. G., ditto.
Branson, J. H. A., ditto.
Broadley, A. M., Behar.
Browne, J. F., c.s., Burrisaul.
Burral, Prem Chand, Calcutta.

Campbell, C. H., c.s., England.
-, The Hon'ble Geo., Alipore.
———, J., Darjeeling Terâi.
Carstairs, J. S., c.s., Rampore Beauleah.
Chandra, Sreenath, Calcutta.
Chatterjea, Bhairub Chunder, Chittagong.
———, Bunkim Chunder, Berhampore.
Chevers, Norman, M.D., Calcutta.
Chuckerbutty, S. G., M.D., ditto.
Clark, W., Calcutta.
Clarton, H., ditto.
Coates, J. M., M.D., Moorshedabad.
Cornell, W., c.s. Mymensing.
Cowasjee Manockjee Rustomjee, Calcutta.
Cowell, Mrs. Herbert, Alipore.
Coxhead, E. T., c.s., Gya.
Crawford, J. A., c.s., Calcutta.

Dall, Rev. C. H. A., Calcutta.
Dass, Gooru Churn, Jamooakandee.
——, Nilmoney, Commilla.
Davis, W. Parry, Midnapore.
Deb, Kumar Harendra Krishna, Calcutta.
Dey, Kanye Lall, Calcutta.
——, Netra Lal, Dacca.
Dhunjeebhoy Framjee, Bombay.
Dhur, Behari Lal, Calcutta.
Donough, T. A., Jamalpore, Mymensing.
Dowleans., Baron A. M., Calcutta.
Drummond, Hon'ble R., Bareilly.
Duff, W. P., Calcutta.
Dutt, Debendra Chunder, Calcutta.
-, Dwarka Nath, ditto.
-, Gooru Dass, ditto.
-, Kali Prosonno, ditto.
-, Kedar Nath, Pooree.

Eduljee Nussurwanjee Colabawalla, Bombay.
Ewart, J., M.D., Calcutta.

Farquhar, T., M D., England.
Farr, Geo. Charles, Calcutta.
Fayrer, J., M.D., C.S.I., ditto.
Field, C. D., c.s., Chittagong.
——, G., Chupra.

Gangooly, Denonath, Kurhurbari.
Geoghegan, J., c.s., Calcutta.
Ghosal, Issur Chunder, ditto.

Ghose, Debendra Chunder, Calcutta.
———, Jodoo Nath, ditto.
———, Monmohun, ditto.
———, Rausbehari, ditto.
Gray, H. A., Calcutta.
Grimley, W. H., c.s., Burrisaul.
Gubboy, Elias S., Calcutta.
————, Raphael, ditto.

Harding, Miss, Calcutta.
Harris, H. N., Jessore.
Harrison, H. L., c.s., Calcutta.
Heeley, W. L., c.s., Alipore.
Hirjeebhoy Manockjee Rustomjee, Calcutta.
Hogg, Charles Stuart, c s., Calcutta.
Howell, A. P., c.s., Calcutta.

Ikram Rusool, Moulvi, Cuttack.
Ingram, T. D., Calcutta.
Innes, W. F , M.D., C.B., ditto.
Irvine, W., c.s., Benares.

Kellner, G. W., Calcutta.
Knight, J. B., ditto.

Law, Roma Nath, Calcutta.
Lazarus, C., ditto.
Leeds, R. J., Chunar.
Lobb, S., Kishnagur.
Locke, H. H., Calcutta.
Long, Rev. J., ditto.
Lynch, S., M.D., ditto.

MacLeod, S., M.D., Calcutta.
Manockjee Rustomjee, Calcutta.
Mazoomdar, Baradakant, Cuttack.
Merwanjee Hormusjee Mehta, Calcutta.
Missra, Rajendra Lal, Bhowanipore.
Mitter, The Hon'ble Dwarkanath, ditto.
-, Greesh Chunder, Calcutta.
———, Mohendra Nath, ditto.
———, Peary Chand, ditto.
———, Rajendra Nath, ditto.
Moncrieff, R. Scott, ditto.
Mookerjea, Bhudeb, Chinsurah.
————, Gunga Persad, Bhownipore.
————, Juggodanund, ditto.
————, Peary Mohun, Ooterparah.
Moulik, Denobundhoo, Burrisaul.
Muir, The Hon'ble Sir W., K.C.S.I, Allahabad.
Mullick, Jadoo Lal, Calcutta.
———, Prosad Dass, ditto.
———, Taruck Nath, ditto.
Muncherjee Sapoorjee, ditto.

Norman, Colonel F. B., England.
Nowrozjee Furdoonjee, Bombay.

Orr, J. C., Calcutta.

Parker, J. A., Calcutta.
Plowden, T. J. Chichele, c. s., Serampore.
Pradhan, Indra Narain, Doro Devoge.
Puckle, Major J., Bangalore.

Quinn, C. C., c.s., Jessore.

Rajah Chunder Nath Roy Bahadoor, Nattore.
——— Pramothanath Roy Bahadoor, Diggaputteah.
Remfry, J., Calcutta.
Robb, Gordon, ditto.
Roberts, J. B., ditto.
Roussac, A. G., ditto.
Roy, Mohini Mohun, Bhowanipore.
Samuells, Lieut. W. L., Pachamba, Hazareebagh.
Sanyal, Denobundhoo, Sooree.
Sarbadhikari, Prosonno Kumar, Calcutta.
Sen, Keshub Chunder, Calcutta.
——, Moorali Dhur, ditto.
Sime, John, Agra.
Sirkar, Mohendra Lal, M.D., Calcutta.
———, Shama Churn, ditto.
Smith, D. K., England.
Sorabjee, Nowrozjee Wadya, Bombay.
Souttar, W. M., c.s., England.
Stephen, Carr, c.s , Delhi.
Stephenson, Rev. J., Calcutta.
Stevens, C. C., c.s , Nuddea.
Stewart, Capt. Duncan J., Jullunder.
Stuart, Rev. E. C., Calcutta.
Swinhoe, W., ditto.

Tagore, Annoda Nundun, Calcutta.
Tawney, C., ditto.
Temple, Sir Richard, K.C.S.I., ditto.
Tonnerre, C. Fabre, ditto.
Tottenham, L. R., c.s., Howrah.
Turnbull, R., Calcutta.
Turner, T. H., ditto.

Wagstaff, P., Calcutta.
Wheeler, J. Talboys, Rangoon.
Wilson, James, Calcutta.
-, R. H., c.s., ditto.
Woodrow, H., ditto.
Wyman, F. F., ditto.

HONORARY MEMBERS.

Carpenter, Miss Mary, Bristol.
Nightingale, Miss Florence, London.
Phear, Hon'ble J. B., Ballygunge.

CONNAGHUR BRANCH ASSOCIATION.

Banerjea, Raus Behari.
Chatterjea, Dwarka Nath.
———, Jadoo Gopal.
Deb, Greesh Chunder.
——, Shib Chunder.
Mitter, Gobind Chunder.
———, Kassi Prosonno.
———, Troylukho Nauth.
Mookerjea, Chunder Shikar.

BOMBAY LIFE MEMBERS.

Bomanjee Jejeebhoy.
Byramjee Jejeebhoy, Hon'ble.
Corsetjee Nusserwanjee Cama.
Dinshaw Manockjee Petit.
Framjee Nusserwanjee.
Korsondas Madhavadas.
Merwanjee Framjee Panday.
Mungledas Nathoobhoy, Hon'ble.
Nusserwanjee Ardaseer Wadya.
Nusserwanjee Manockjee Petit.
Pestonjee Hormusjee Suntook.
Puddumjee Rostumjee Khan Bahadoor, Poona.
Sorabjee Shapoorjee.
Venyeckrow Juggernathjee Sunkersett.

MUZUFFERPORE BRANCH ASSOCIATION.

Saiad Mahomed Tuckee Khan—*President.*
Baboo Bhupati Roy Bahadoor—*Vice-President.*
Saiad Imdad Ali—*Secretary.*
Baboo Radhagobind Dutt—*Assistant Secretary,*

Baboo Bishendeo Narain Saheo,
„ Ishwar Narain Singh,
Kadar Nath Banerjee,
Mohes Chunder Chatterjee,
Poorna Chunder Mitter,
Shib Chunder Chatterjee,
Wooma Churn Mozumdar,
Womesh Chunder Roy,
Moulvi Abdurruheem,
Moonshi Binda Persad,
Mahomed Amir,
Phool Chund Lal,
Sitaram,
Members.